

1 August 9, 2011  
2 Candidate Standard 5108.05-2011



3  
4 The Printer Working Group

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7 **FaxOut Service**  
8 **Semantic Model and Service Interface**

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10 Status: Approved  
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15  
16 **Abstract:** Network print devices have evolved to support additional multifunction services, in particular FaxOutService.  
17 When FaxOut Devices are installed in local office or enterprise networks, they need remote service, device, and job  
18 management capabilities so that administrators, operators, and end users can monitor their health and status. In addition,  
19 such FaxOut Devices need remote job submission capabilities so that operators and end users can create FaxOut Jobs  
20 without depending entirely on local console interfaces. This document defines a semantic model for service, device, and  
21 job management and job submission for these FaxOut Devices.

22  
23 This document is a PWG Candidate Standard. For a definition of "PWG  
24 Candidate Standard ", see:

25  
26 <ftp://ftp.pwg.org/pub/pwg/general/pwg-process30.pdf>

27  
28 This document is available electronically at:

29  
30 <ftp://ftp.pwg.org/pub/pwg/candidates/cs-sm20-faxout10-20110809-5108.05.pdf>  
31

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# Contents

99

100	1	Introduction .....	6
101	2	Overview .....	6
102	3	Terminology .....	7
103	3.1	Conformance Terminology .....	7
104	3.2	Service Specific Terminology .....	7
105	3.3	Model Mapping Conventions .....	7
106	3.4	Naming Conventions .....	7
107	4	Requirements.....	7
108	4.1	Rationale for the FaxOutService Specification .....	7
109	4.2	Out of Scope for FaxOutService.....	7
110	5	MFD Model Overview .....	8
111	6	FaxOutService Model Overview .....	8
112	6.1	FaxOutServiceDefaults .....	9
113	6.2	FaxOutServiceCapabilities .....	10
114	6.3	FaxOutServiceCapabilitiesReady .....	12
115	6.4	FaxOutServiceConfiguration.....	12
116	6.5	FaxOutServiceDescription .....	13
117	6.6	FaxOutServiceStatus .....	15
118	7	FaxOutJob Model.....	17
119	7.1	FaxOutJobReceipt .....	18
120	7.2	FaxOutJobStatus .....	18
121	7.3	FaxOutJobTicket.....	20
122	7.3.1	FaxOutDocumentProcessing .....	20
123	7.3.2	FaxOutJobDescription.....	22
124	7.3.3	FaxOutJobProcessing.....	23
125	8	FaxOutDocument Model.....	24
126	8.1	FaxOutDocumentReceipt .....	25
127	8.2	FaxOutDocumentStatus .....	25
128	8.3	FaxOutDocumentTicket.....	27
129	8.3.1	FaxOutDocumentDescription .....	28
130	8.3.2	FaxOutDocumentProcessing .....	28
131	9	FaxOutService Interfaces .....	28
132	10	Conformance Requirements.....	31
133	10.1	Client Conformance Requirements .....	31
134	10.2	FaxOutService Conformance Requirements.....	31
135	10.2.1	Objects .....	31
136	10.2.2	Operations.....	32
137	10.2.3	3 Job History .....	32
138	10.3	FaxOutService Elements .....	32
139	10.4	Extensions .....	32
140	11	PWG and IANA Registration Considerations .....	32
141	12	Internalization Considerations .....	32
142	13	Security Considerations .....	33
143	13.1	Protection of End User's FaxIn Data .....	33
144	14	References.....	33
145	14.1	Normative References .....	33
146	14.2	Informative References.....	34
147	15	Author's Address.....	35

148  
149  
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168  
169  
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171  
172  
173  
174  
175  
176

# Figures

- Figure 1 High Level FaxOutService Schema..... 8
- Figure 2 FaxOutServiceDefaults ..... 10
- Figure 3 FaxOutServiceCapabilities ..... 11
- Figure 4 FaxOutServiceConfiguration..... 13
- Figure 5 FaxOutServiceDescription ..... 14
- Figure 6 FaxOutServiceStatus ..... 16
- Figure 7 JobTable ..... 17
- Figure 8 High Level FaxOutJob View ..... 18
- Figure 9 FaxOutJobStatus ..... 19
- Figure 10 FaxOutJobTicket..... 20
- Figure 11 FaxOutDocumentProcessing..... 21
- Figure 12 FaxOutJobDescription ..... 22
- Figure 13 FaxOutJobProcessing..... 23
- Figure 14 High Level FaxOutDocument View..... 24
- Figure 15 FaxOutDocumentStatus ..... 26
- Figure 16 FaxOutDocumentTicket ..... 27
- Figure 17 FaxOutDocumentDescription..... 28

# Tables

- Table 1 FaxOutServiceCapabilities..... 11
- Table 2 Mandatory User Operations..... 29
- Table 3 Optional User Operations ..... 29
- Table 4 Administrative Operations..... 30

## 177 **1 Introduction**

178 This document specifies the PWG abstract model for a FaxOutService of a Multifunction Device (MFD). Included in  
179 this document is the service specific terminology, data model, the theory of operation, the FaxOutService interfaces  
180 and the conformance requirements. The MFD FaxOutService abstract model include the functional model and  
181 interfaces of a FaxOutService.

## 182 **2 Overview**

183 The MFD Facsimile service addressed in this specification is the FaxOutService. The FaxOutService responds to  
184 queries about its capabilities, configuration and descriptive information. It responds to queries for information about  
185 the FaxOut Jobs and their associated Documents. It manages and processes FaxOut Jobs with their associated  
186 FaxOutJobTicket and stores the digital output. A FaxOut Client application contains a FaxOut Client. A FaxOut  
187 client application interacts with the end user to obtain the end user's FaxOut Intent and uses the FaxOut Client to  
188 communicate with the FaxOutService that will satisfy the end user's FaxOut Intent.  
189

190 FaxOut Templates contain instructions representing preconfigured FaxOut intent that can be used as is or modified  
191 by the end user. Once the end user is satisfied with the FaxOut Template the FaxOut client application passes the  
192 FaxOut Job Template to the FaxOut Job Client for submission to the FaxOutService. FaxOut Templates may be  
193 obtained in a number of ways all of which are outside the scope of this specification.  
194

195 The Faxing scenarios addressed in this specification range from walk-up users that use an MFD's front panel to  
196 send FaxOut Jobs to remote users that use their computers to send FaxOut Jobs. Users may also use workflow  
197 applications in an enterprise to send FaxOut Jobs. For batch FaxOut Jobs of single or multiple documents, the  
198 model supports automated sending of a stack of documents each separated by an individual FaxOut Instruction  
199 Sheet. A FaxOut Instruction Sheet is an implementation specific hard copy version of a FaxOutJobTicket and is  
200 outside the scope of this specification. The model also supports external security services that protect against  
201 unauthorized use of a FaxOutService and access of FaxOut digital data.  
202

## 203 **3 Terminology**

### 204 **3.1 Conformance Terminology**

205 See [RFC2119] for conformance terminology used. There are no FaxOut-specific conformance terms.

### 206 **3.2 Service Specific Terminology**

207 See MFD Model and Common Semantics specification [PWG5108.01] for common MFD terminology used. For  
208 this service the “<service>” in the MFD Terminology section is replaced with “FaxOut”. There is no FaxOutService  
209 specific terminology.  
210

### 211 **3.3 Model Mapping Conventions**

212 The FaxOutService model is described in this document as an XML schema. This is for the sake of convenience  
213 and does not require a protocol mapping involving XML. The top level objects such as the Subunits, the Services,  
214 and their associated Jobs and Documents can be represented in any number of ways. In the abstract they are  
215 objects which contain attributes or properties that express characteristics of the object. Within this document  
216 references to Attribute or Element refer to XML Attributes and XML Elements respectively. Either of these can be  
217 abstractly considered to be attributes or properties of abstract objects.

### 218 **3.4 Naming Conventions**

219 The MFD Model and Common Semantics specification [PWG5108.01] describes common concepts and terms  
220 used for all of the services hosted on a Multifunction Device. Also included in the specification are the definitions of  
221 the objects and their attributes in the Multifunction Device data model. The MFD Model and Common Semantics  
222 specification [PWG5108.01] uses abstract names for the semantic elements (e.g., Job State). This document  
223 describes a specific service and uses an XML schema to represent the objects and attributes. XML elements  
224 cannot have names with an embedded whitespace. The names for objects and their attributes used by this  
225 specification are the names from the XML Schema (e.g., JobState). The names can be easily mapped between  
226 the two specifications by inserting or removing the whitespace in the name (e.g., Job State  $\equiv$  JobState).  
227

## 228 **4 Requirements**

### 229 **4.1 Rationale for the FaxOutService Specification**

230 This specification is based on common requirements defined in the Multifunction Device Service Model  
231 Requirements [MFDREQ]. In order to support common functionality for faxing using Multifunction Devices, there is  
232 a clear need to develop a semantic model and a set of abstract operations and elements for FaxOut related  
233 services. In order to implement an abstract model of the operations and elements for FaxOut related services, there  
234 is need to map them onto implementable applications and communication protocols that support interactions  
235 between FaxOut Clients and FaxOutServices. There is a clear need to define a binding of the abstract model into  
236 Web Service Schema and Web Service protocol stack. As with other MFD Service specifications (e.g., Print  
237 Service, Scan Service, Copy Service) the Web Service binding requires a set of WSDL and XML Schema files  
238 based on the associated specification.

### 239 **4.2 Out of Scope for FaxOutService**

240 The basic FaxOutService model defined in this document is targeted to support enterprise FaxOut applications.  
241 However this document does not specify any application specific semantics. The following are out of scope:  
242

- 243 1. Semantics of any compound service that creates separate Jobs for each transform service or destination  
244 URI specified in the original Job.
- 245 2. Semantics of any workflow protocol, i.e., sequencing and coordination of FaxOut jobs across multiple  
246 services.

3. Semantics for the creation of new document or file formats.

## 5 MFD Model Overview

See [PWG5108.01] for the MFD model. The FaxOutService fits within the MFD model as one of a number of services that can be hosted on a Multifunction Device (i.e., System). The critical MFD container Group Element with regard to describing the FaxOutService is Services.

One of the MFD's services is the FaxOutService. There can be multiple instances of a FaxOutService hosted on a Multifunction Device. This allows an implementation to expose multiple queues each with its own set of defaults and capabilities.

The System has a SystemConfiguration Group Element that contains all the subunits that comprise the MFD. Each FaxOutService instance contains a Service-specific view of the subunits used by that service instance. The FaxOutService element FaxOutServiceConfiguration contains the Service-specific view of the associated Subunits.

## 6 FaxOutService Model Overview

Figure 1 is the top level view of the FaxOutService schema.

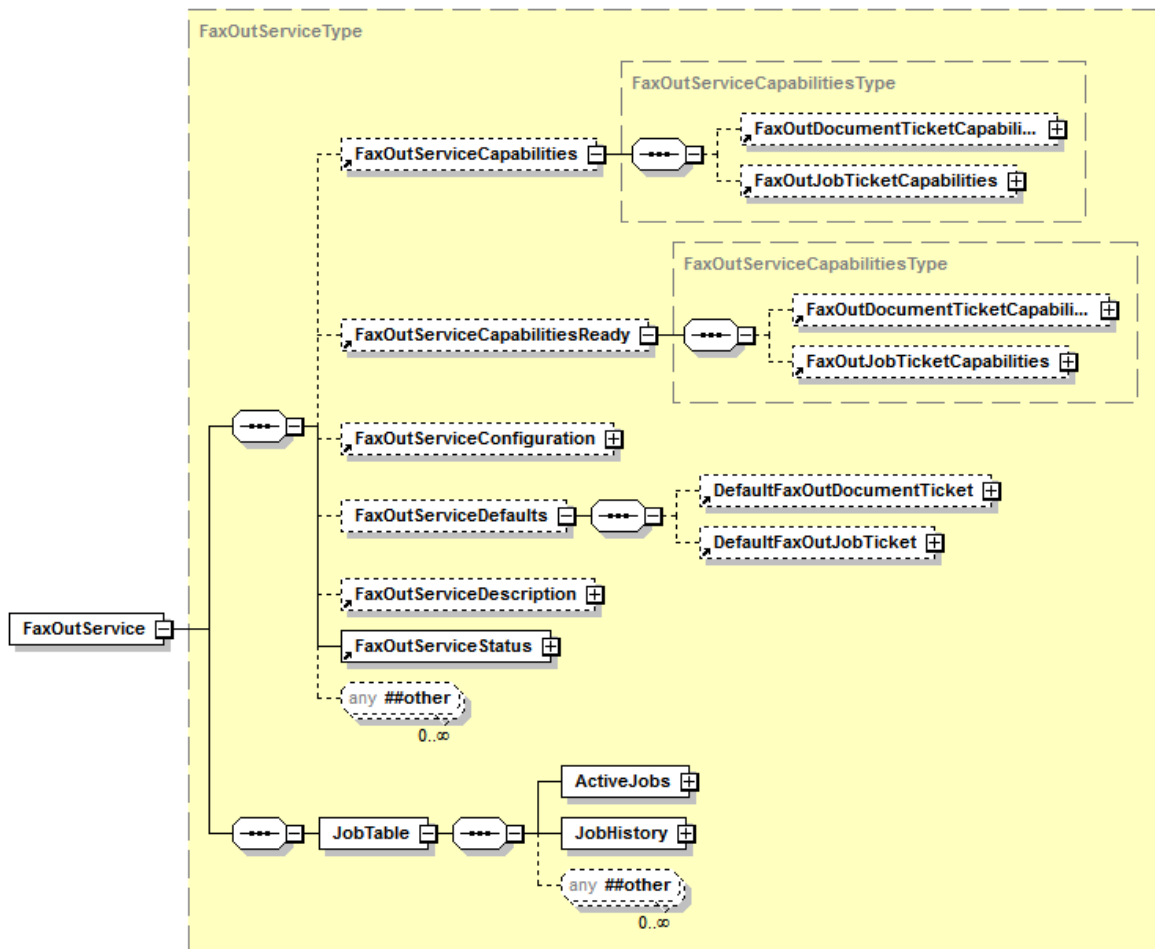


Figure 1 High Level FaxOutService Schema



264 The PWG semantic model supports zero or more FaxOutServices. A FaxOutService is hosted locally on an MFD or  
265 remotely on another computer. The FaxOutService model has an Active Job queue, a Job History and a set of  
266 Elements which includes FaxOutService status, configuration, description, defaults, and processing capabilities.  
267

268 The FaxOutServiceCapabilities Group Element represents the allowed values supported by the FaxOutService for a  
269 FaxOutJobTicket and FaxOutDocumentTicket. The details of each FaxOutServiceCapabilities Elements are specified  
270 in §6.2  
271

272 The FaxOutServiceCapabilitiesReady Group Element represents the allowed values for a  
273 FaxOutJobTicket/FaxOutDocumentTicket that do not require operator intervention (e.g., the media that is actually  
274 loaded in an input tray). The details are specified in §6.3  
275

276 The FaxOutService Configuration provides a FaxOutService-specific view into the Subunits that are associated with  
277 this service instance. Only Subunits that are used by the FaxOutService will appear in this element. The details of  
278 each subunit are detailed in §6.4. The System element provides an all-encompassing view of all  
279 the Subunits of the MFD.  
280

281 The FaxOutServiceDefaults Group Element contains FaxOutJobTicket and FaxOutDocumentTicket default values. The  
282 values contained in the default tickets are the values that that will be used by the FaxOutService when processing a  
283 FaxOutJobTicket/FaxOutDocumentTicket which does not explicitly specify a different value. The values for this are  
284 populated in an implementation specific manner. The details of the DefaultFaxOutTicket are specified in §6.1.  
285

286 The FaxOutServiceDescription Group Element includes descriptive information such as service name and information,  
287 and has an extension point for vendor specific information. These Description Elements are can be set by  
288 Administrators. Similar to FaxOutService state elements, there are localized Description Elements for each supported  
289 Description Element. The details of the FaxOutServiceDescription Elements are specified in §6.5.  
290

291 The FaxOutServiceStatus Group Element is an extension of the SystemServiceStatus class that includes elements  
292 such as ID, state, service counters, state messages and state reasons. State messages are localized state reasons.  
293 The only FaxOutService-specific status extensions are the FaxOutService-specific counters. The details of the  
294 Elements in the FaxOutServiceStatus group are specified in §6.6.  
295

296 A FaxOutService contains zero or more jobs. Each job has a zero or more Documents which reference a Destination  
297 where the Digital Document(s) are stored as files. The FaxOutService organizes its FaxOutJobs in two job queues: (1)  
298 ActiveJobs, (2) JobHistory. ActiveJobs is a queue maintaining a list of jobs that are pending or processing. The  
299 JobHistory queue maintains a log of FaxOut that have reached a terminating state (i.e., Completed, Aborted, or  
300 Canceled). The retention period for jobs in the JobHistory list is implementation specific but MUST NOT be less than  
301 300 seconds. Before a Job can be deleted from the JobHistory, the Job metadata (e.g., JobId, DateTimeAtCompleted,  
302 JobOriginatingUserName, DestinationUri) MUST be durably logged.  
303

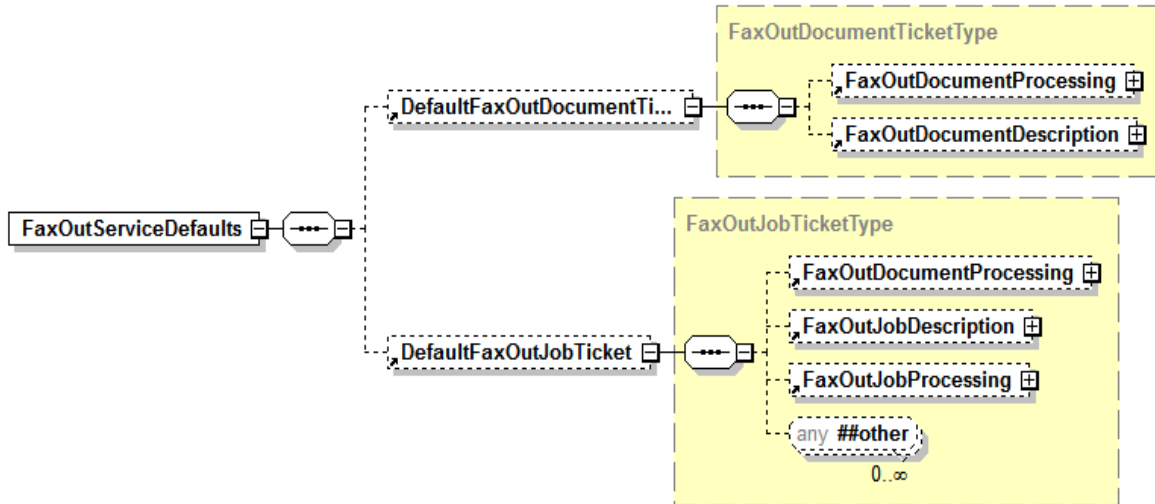
304 Each FaxOutJob can contain a FaxOutJobTicket which provides descriptive information as well as JobProcessing and  
305 DocumentProcessing instructions. The DocumentProcessing instructions apply to all documents within the job unless  
306 overridden at the document level with a FaxOutDocumentTicket.  
307

308 Each FaxOutJob contains zero or more FaxOutDocuments. There is a time between the creation of a job and  
309 when the first document is added that the number of documents is zero. Support of multidocument jobs is  
310 OPTIONAL and implementation specific. The service's support for multidocument jobs can be determined by  
311 examining the MultipleDocumentJobsSupported element in FaxOutServiceDescription. Note that PSTN FaxOut  
312 jobs either: (a) do not support multiple documents; or (b) do not distinguish the document boundaries in the FaxOut  
313 transmission.  
314

## 315 **6.1 FaxOutServiceDefaults**

316 The FaxOutServiceDefaults provides the values that will be used if the element is omitted in a FaxOutJob's  
317 FaxOutJobTicket or FaxOutDocumentTicket. Note that the processing instructions are not bound to the FaxOutJob  
318 until the FaxOutJob is actually processed. The values from the FaxOutServiceDefaults MUST NOT be copied to  
319 the Job's FaxOutJobTicket or the Document's FaxOutDocumentTicket. If the FaxOutJobReceipt is supported, the

320 combined elements from the user supplied FaxOutJobTicket and the applied values from the  
 321 DefaultFaxOutJobTicket are copied to the FaxOutJobReceipt. The DefaultFaxOutJobTicket elements MUST NOT  
 322 be copied to the Job's FaxOutJobTicket or the Document's FaxOutDocumentTicket. Similarly if the  
 323 FaxOutDocumentReceipt is supported, the combined elements from the user supplied FaxOutDocumentTicket and  
 324 the applied values from the DefaultFaxOutDocumentTicket are copied to the FaxOutDocumentReceipt.  
 325



326

327

**Figure 2 FaxOutServiceDefaults**

328

329 For descriptions of the elements that comprise FaxOutDocumentDescription, FaxOutJobDescription,  
 330 FaxOutJobProcessing and FaxOutDocumentProcessing see §7.3 on FaxOutJobTicket  
 331

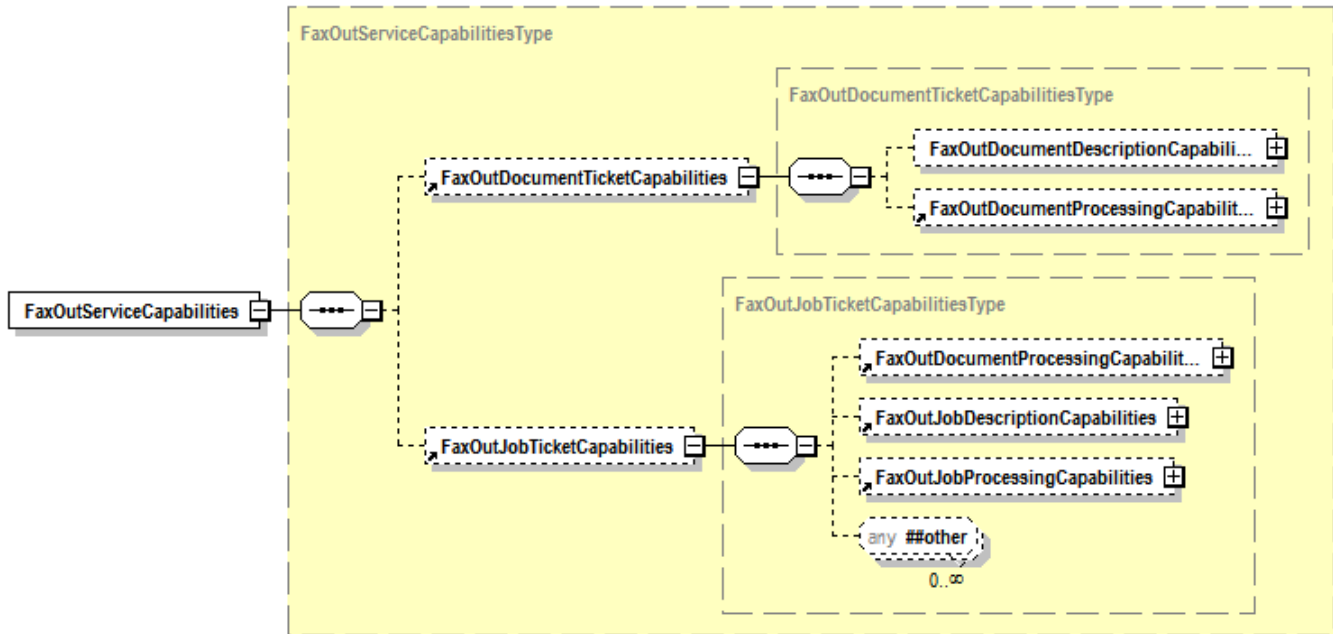
332

## 6.2 FaxOutServiceCapabilities

333 The FaxOutServiceCapabilities provides information about the elements that can be used in FaxOutJobTickets and  
 334 FaxOutDocumentTickets. The values of the elements in FaxOutServiceCapabilities indicate all the supported  
 335 values for a FaxOutJobTicket and FaxOutDocumentTicket submitted to the FaxOutServer instance (e.g., all the  
 336 available resolutions, the available job priorities). The names of the elements within the FaxOutServiceCapabilities  
 337 are the same as those in the FaxOutJobTicket. See §7.3 and §8.3 for the names of the  
 338 FaxOutDocumentDescriptionCapabilities, FaxOutDocumentProcessingCapabilities,  
 339 FaxOutJobDescriptionCapabilities, and FaxOutJobProcessingCapabilities elements.

340 Although most of the elements have the same name as their FaxOutJobTicket counterparts the syntax is often  
 341 different. For example an element such as InputSource that is a single keyword in FaxOutJobTicket is a sequence  
 342 of keywords in FaxOutServiceCapabilities. The values list the allowed values for the FaxOutJobTicket element.  
 343 Some elements that are of the data type integer in a FaxOutJobTicket are a range of integers in  
 344 FaxOutServiceCapabilities. Other elements that are simple strings or predefined ranges in the FaxOutJobTicket  
 345 are simply Boolean values in FaxOutServiceCapabilities, indicating supported FaxOutJobTicket elements. See  
 346 [PWG5108.01] for details on the syntax.

347



348

349

**Figure 3 FaxOutServiceCapabilities**

350

351

352

**Table 1 FaxOutServiceCapabilities**

353

Group	Elements described in [PWG5108.01]
FaxOutDocumentDescriptionCapabilities	DocumentDigitalSignature, DocumentMessage, DocumentName, DocumentNaturalLanguage, LastDocument, CompressionSupplied, DocumentCharsetSupplied, DocumentDigitalSignatureSupplied, DocumentFormatDetailsSupplied, DocumentFormatSupplied, DocumentFormatVersionSupported, DocumentMessageSupplied, DocumentNameSupplied, DocumentUri, Impressions, KOctets, MediaSheets, PageorderReceived
FaxOutDocumentProcessingCapabilities	NumberUp, PresentationDirectionNumberUp, AutoSkewCorrection, ContentType, Exposure, HeaderPrint, Quality, Resolutions <sup>1</sup> , Scaling, DocumentSizeAutoDetect, ScanRegions, sides
FaxOutJobDescriptionCapabilities	ElementsNaturalLanguage, JobAccountingID, JobAccountingUserID, JobMandatoryElements, JobMessageFromOperator, JobMessageToOperator, JobMorInfo, JobName, JobOriginatingUserName, JobOriginatingUserUri, JobPassword, JobPasswordEncryption, KOctets, TemplateCreatorName, TemplateId, TemplateInfo, TemplateName, TemplateType, CompressionSupplied, DocumentCharsetSupplied, DocumentDigitalSignatureSupplied, DocumentFormatDetailsSupplied, DocumentFormatSupplied, DocumentFormatVersionSupported, DocumentMessageSupplied, DocumentNameSupplied
FaxOutJobProcessingCapabilities	JobDelayOutputUntil <sup>2</sup> , JobDelayOutputUntilTime <sup>2</sup> , JobHoldUntil <sup>2</sup> , JobHoldUntilTime <sup>2</sup> , JobMandatoryElements, JobPhoneNumber,

	JobPriority, JobRecipientName, ConfirmationSheetPrint, CoverSheetInfo, DestinationUris, JobAccountingSheets, JobSaveDisposition, RetryInfo
--	--

354 <sup>1</sup> Resolution in the FaxOutJobTicket's FaxOutDocumentProcessing is a single instance of Resolution from  
 355 the sequence of Resolutions element in FaxOutDocumentProcessingCapabilities.

356 <sup>2</sup>For the FaxOut Service holding or delaying a job means to delay the transmission of the facsimile.  
 357

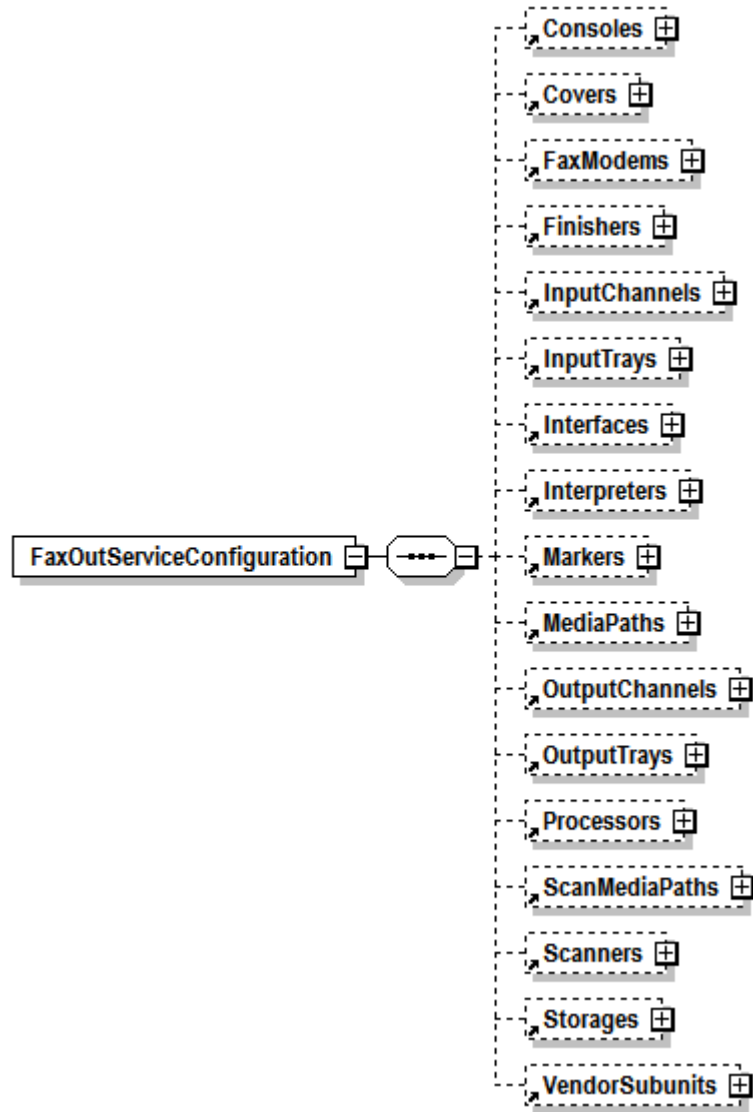
### 358 **6.3 FaxOutServiceCapabilitiesReady**

359 FaxOutServiceCapabilitiesReady provides information about the elements that can be used in FaxOutJobTickets  
 360 and FaxOutDocumentTickets. The values of the elements in FaxOutServiceCapabilitiesReady indicate all the  
 361 values for a FaxOutJobTicket and FaxOutDocumentTickets that can be submitted to the FaxOutServer instance  
 362 and applied without operator intervention. The names of the elements within FaxOutServiceCapabilitiesReady are  
 363 the same as those in FaxOutServiceCapabilities. See §7.3 and §8.3 for the names of the  
 364 FaxOutDocumentDescriptionCapabilities, FaxOutDocumentProcessingCapabilities,  
 365 FaxOutJobDescriptionCapabilities, and FaxOutJobProcessingCapabilities elements.

366

### 367 **6.4 FaxOutServiceConfiguration**

368 The types of Subunits defined in the MFD Model and Common Semantics specification [PWG5108.01] that are  
 369 applicable to a FaxOutService are Console, Cover, FaxModem, Finisher, InputChannel, InputTray, Interface,  
 370 Interpreter, Marker, MediaPath, OutputChannel, OutputTray, Processor, ScanMediaPath, Scanner, Storage and  
 371 optionally VendorSubunits. There are no standard subunits unique to the FaxOutService.  
 372  
 373



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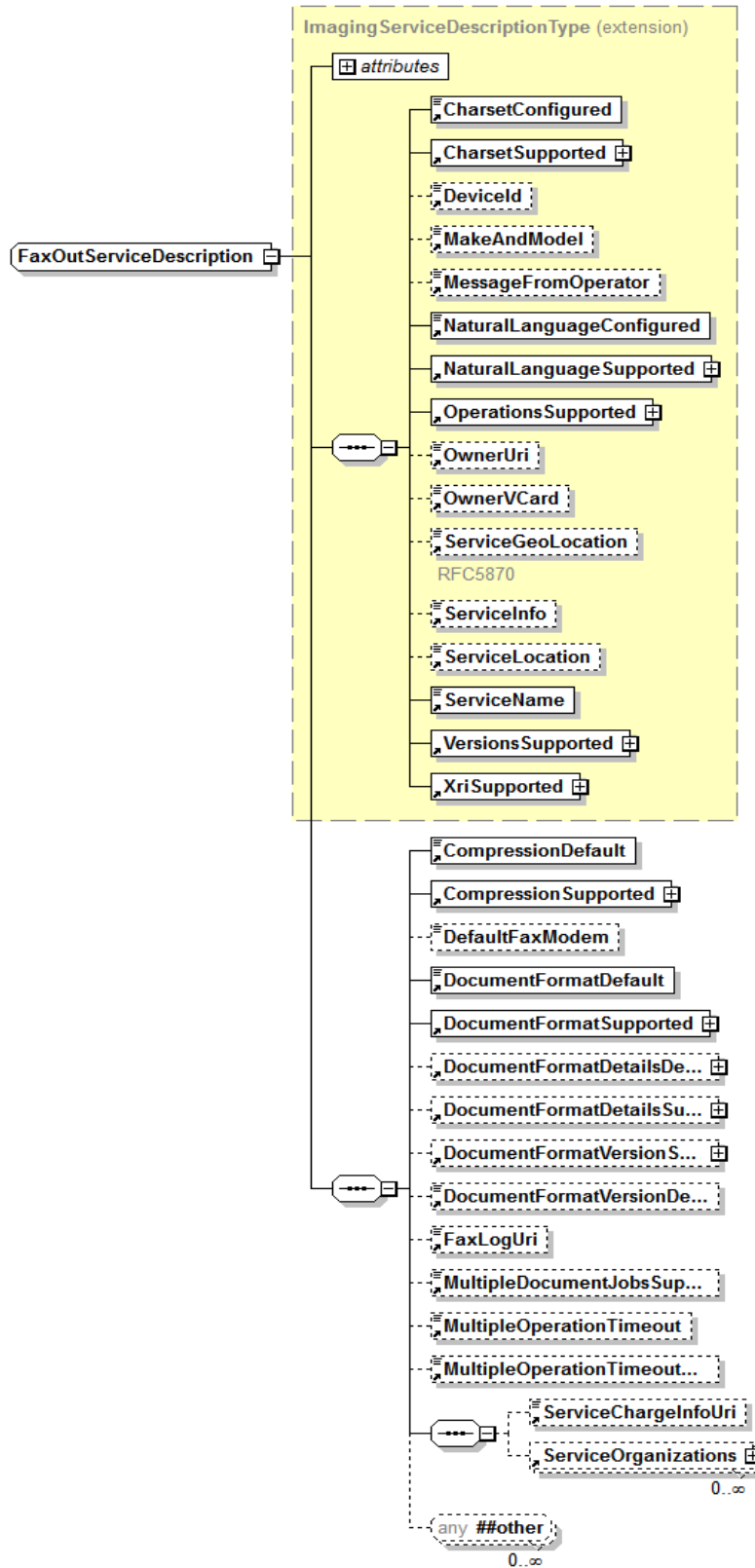
Figure 4 FaxOutServiceConfiguration

### 379 6.5 FaxOutServiceDescription

380 Figure 5 is a view of the Description elements for the FaxOutService. The Description elements provide  
381 descriptive information for the FaxOutService. The elements are administratively set. The element values can be  
382 modified directly or modified indirectly through an operation.

383

384



385

386

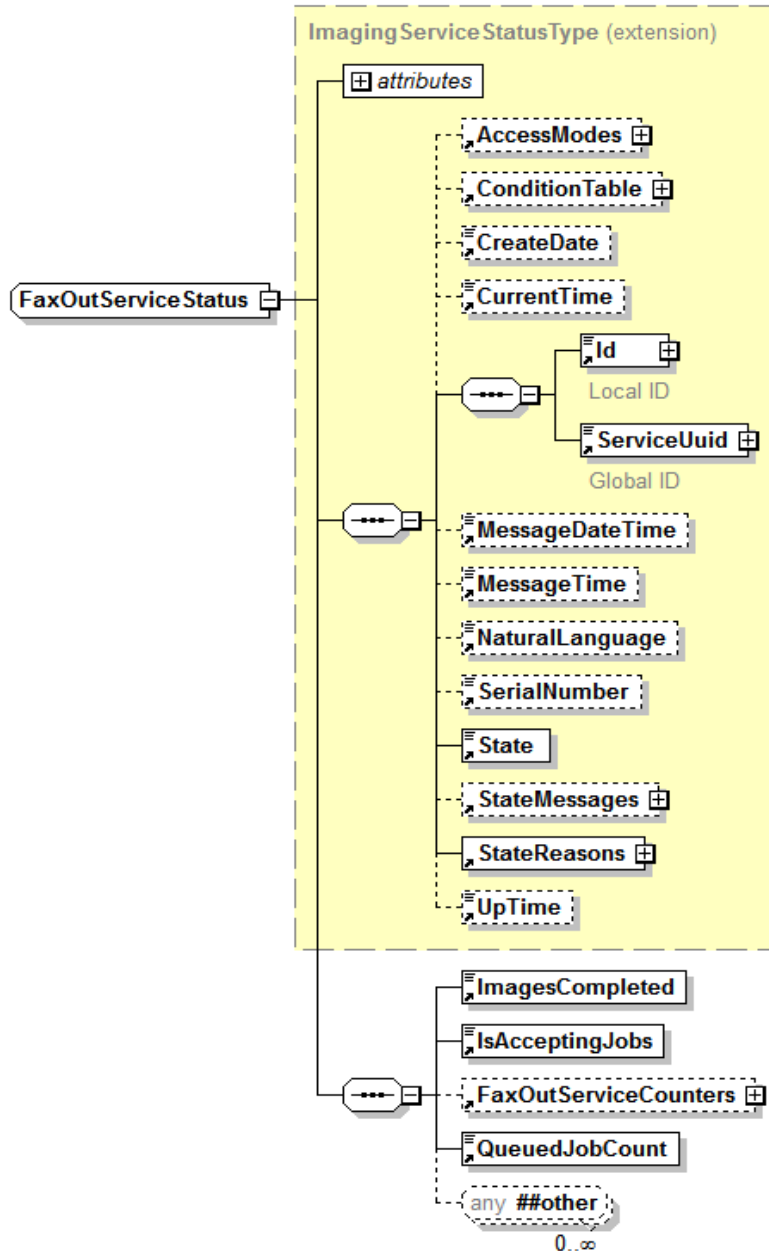
387

Figure 5 FaxOutServiceDescription

388 The elements common to all Service Descriptions are also described in the MFD Model and Common Semantics  
389 specification [PWG5108.01]. Those elements are identified in Figure 5 by being included in the yellow box. The  
390 remaining elements are common elements used by FaxOut. These elements are also described in the MFD Model  
391 and Common Semantics specification [PWG5108.01]. Note that FaxLogURI specifies the location of the durable  
392 log that is REQUIRED for all FaxOutService implementations (see section 7).

## 393 **6.6 FaxOutServiceStatus**

394 Figure 6 is a view of the Status elements for the FaxOutService. The Status elements provide state information for  
395 the FaxOutService. The elements are maintained by automata and cannot be directly set. The element values  
396 can be modified indirectly through an operation. For example PauseFaxOutService operation on the  
397 FaxOutService may result in the change of the State and StateReasons elements.  
398



399

400

**Figure 6 FaxOutServiceStatus**

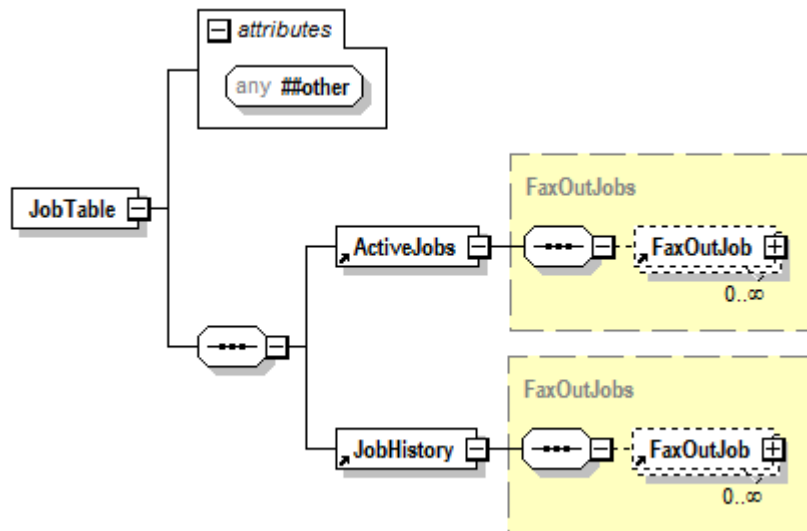
401

402 The elements common to all `<service>ServiceStatus` are described in the MFD Model and Common Semantics  
 403 specification [PWG5108.01]. Those elements are identified in Figure 6 by being included in the yellow box. The  
 404 remaining elements are common elements used by FaxOut. These elements are also described in the MFD Model  
 405 and Common Semantics specification [PWG5108.01].



406 **7 FaxOutJob Model**

407 Figure 7 is the top level view of the FaxOutJob. The jobs appear in one of two lists. Pending and active jobs  
 408 appear in the ActiveJobs list. Jobs that have reached a terminal state (i.e., Completed, Aborted, and Canceled)  
 409 appear in the JobHistory list. Note that the JobHistory list is REQUIRED and the retention period for jobs in the  
 410 JobHistory list is implementation specific but MUST NOT be less than 300 seconds. Before a Job can be deleted  
 411 from the JobHistory, the Job metadata (e.g., JobId, DateTimeAtCompleted, JobOriginatingUserName,  
 412 DestinationUri) MUST be durably logged to the location specified in FaxLogURI (see section 6.5).



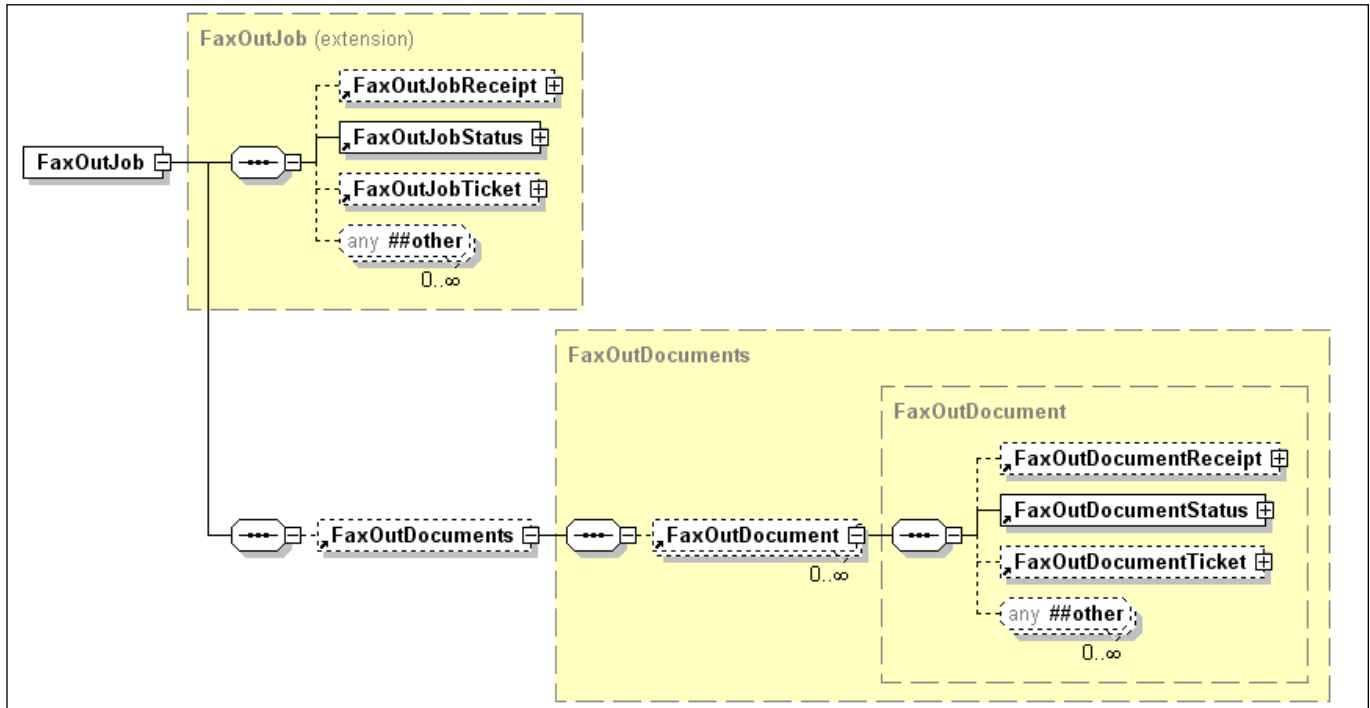
413

414

**Figure 7 JobTable**

415 FaxOutJobs can contain zero or more documents. During job creation it is possible that temporarily there are zero  
 416 documents. The state of the job is described in the FaxOutJobStatus element. FaxOutJobTicket contains  
 417 descriptive information about the job and the Job and Document processing instructions. It is possible to override  
 418 the Document Processing instructions on a document by document basis by supplying a FaxOutDocumentTicket  
 419 with the FaxOutDocument. The FaxOutJobTicket and FaxOutDocumentTicket represent the End User's intent  
 420 while the FaxOutJobReceipt and FaxOutDocumentReceipt represent what the FaxOutService actually did.

422



423

424

Figure 8 High Level FaxOutJob View

425

### 7.1 FaxOutJobReceipt

426

This element has exactly the same structure as the FaxOutJobTicket. For each processing element of a FaxOutJob, it records the actual value used by the FaxOutService for processing the FaxOutJob. It contains the elements supplied by the FaxOut Client and applied to the job, any element or values substitutions made by the FaxOutService and any default elements or values applied by the FaxOutService. See §7.3 for element descriptions.

430

431

432

### 7.2 FaxOutJobStatus

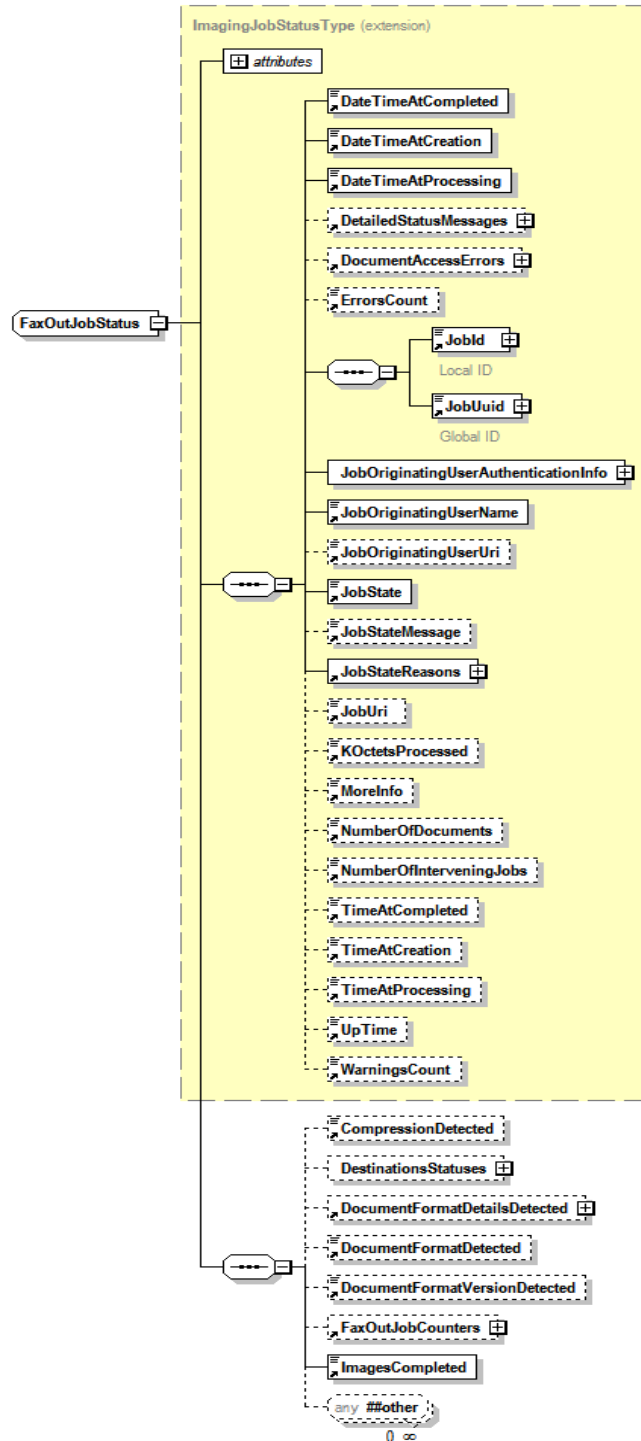
433

Figure 9 is a view of the Status elements for the FaxOutJob. The Status elements provide state information for the FaxOutJob. The elements are maintained by automata and cannot be directly set. The element values can be modified indirectly through an operation. For example CancelFaxOutJob operation on the FaxOutJob may result in the change of the State and StateReasons elements

434

435

436



437

438

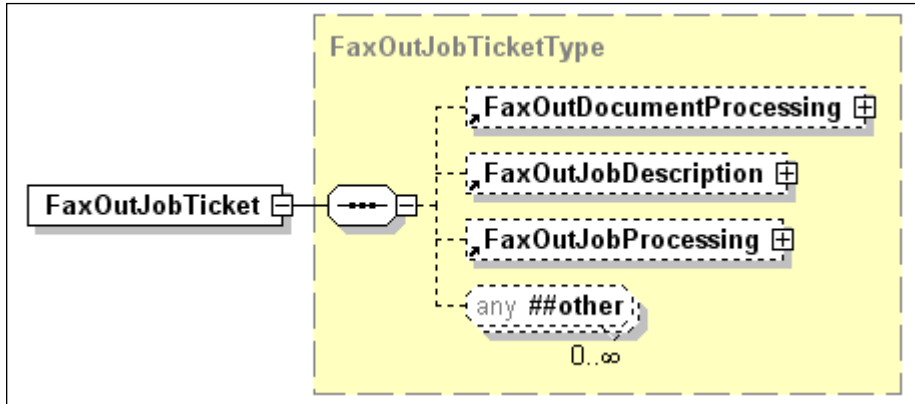
**Figure 9 FaxOutJobStatus**

439 The elements common to all <service>JobStatus are described in the MFD Model and Common Semantics  
 440 specification [PWG5108.01]. Those elements are identified in Figure 9 by being included in the yellow box. The  
 441 remaining elements are common elements used by FaxOut. These elements are also described in the MFD Model  
 442 and Common Semantics specification [PWG5108.01].  
 443

444

445 **7.3 FaxOutJobTicket**

446 The FaxOutJobTicket contains description and processing elements provided by the FaxOut Client during  
 447 FaxOutJob creation. This information is used by the FaxOutService during the processing of a FaxOutJob. This  
 448 information is made available to FaxOut Clients through the GetFaxOutJobElements operation and a subset is  
 449 made available through the GetActiveFaxOutJobs and GetFaxOutJobHistory operations.  
 450



451

452 **Figure 10 FaxOutJobTicket**

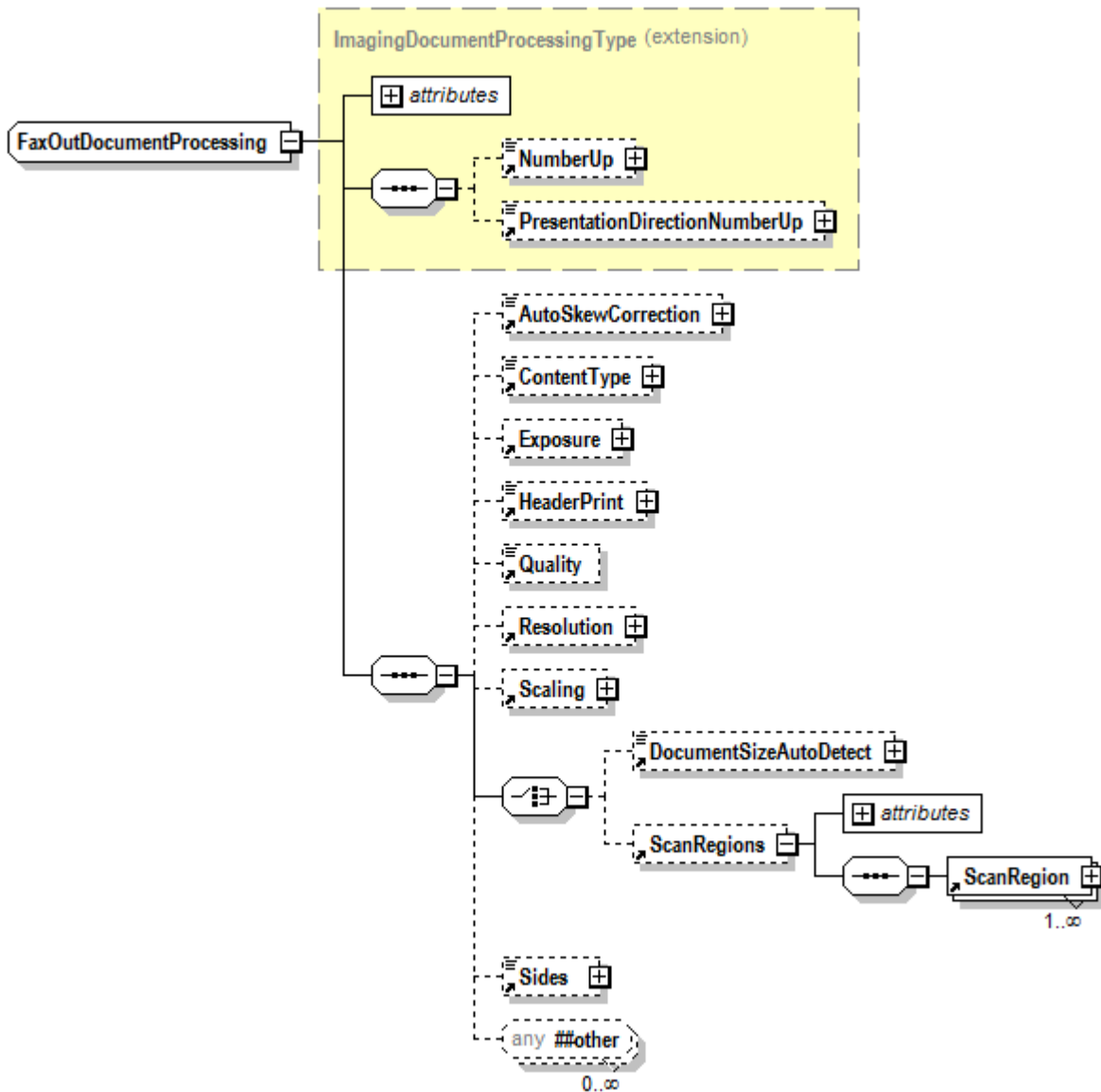
453

454

454 **7.3.1 FaxOutDocumentProcessing**

455 The FaxOutDocumentProcessing provides the document processing instructions that have been requested by the  
 456 End User at the job level. Each element has a MustHonor attribute to indicate whether documents within the job  
 457 must be processed according to what the user has requested.  
 458

459



460

461

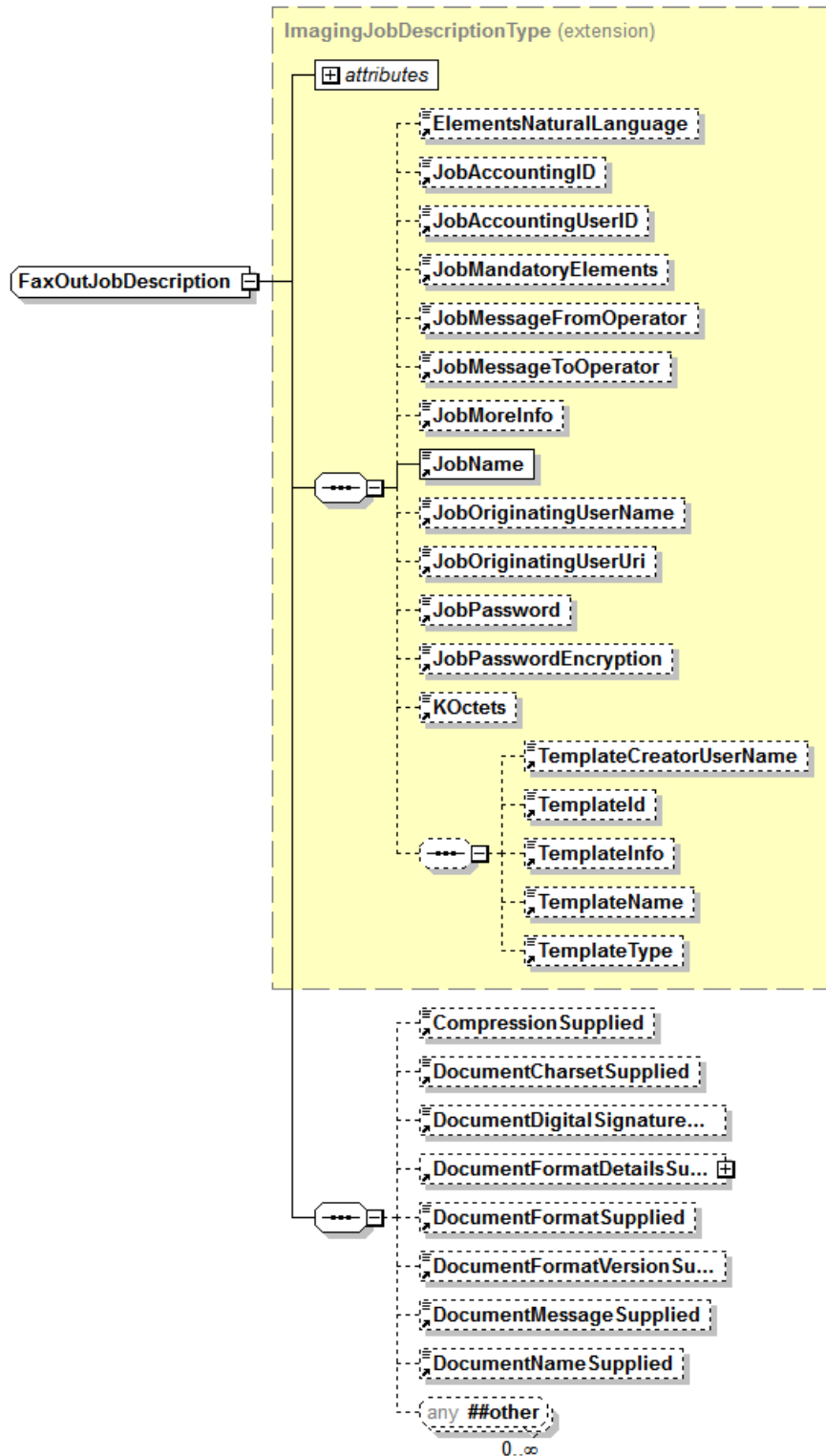
**Figure 11 FaxOutDocumentProcessing**

462

463 The elements common to all <service>DocumentProcessing are described in the MFD Model and Common  
 464 Semantics specification [PWG5108.01]. Those elements are identified in Figure 11 by being included in the yellow  
 465 box. The remaining elements are common elements used by FaxOut. These elements are also described in the  
 466 MFD Model and Common Semantics specification [PWG5108.01].

467 **7.3.2 FaxOutJobDescription**

468 Figure 12 is a view of the Description elements for the FaxOutJob. These elements are set by the FaxOut Client  
 469 during job creation.



470

471

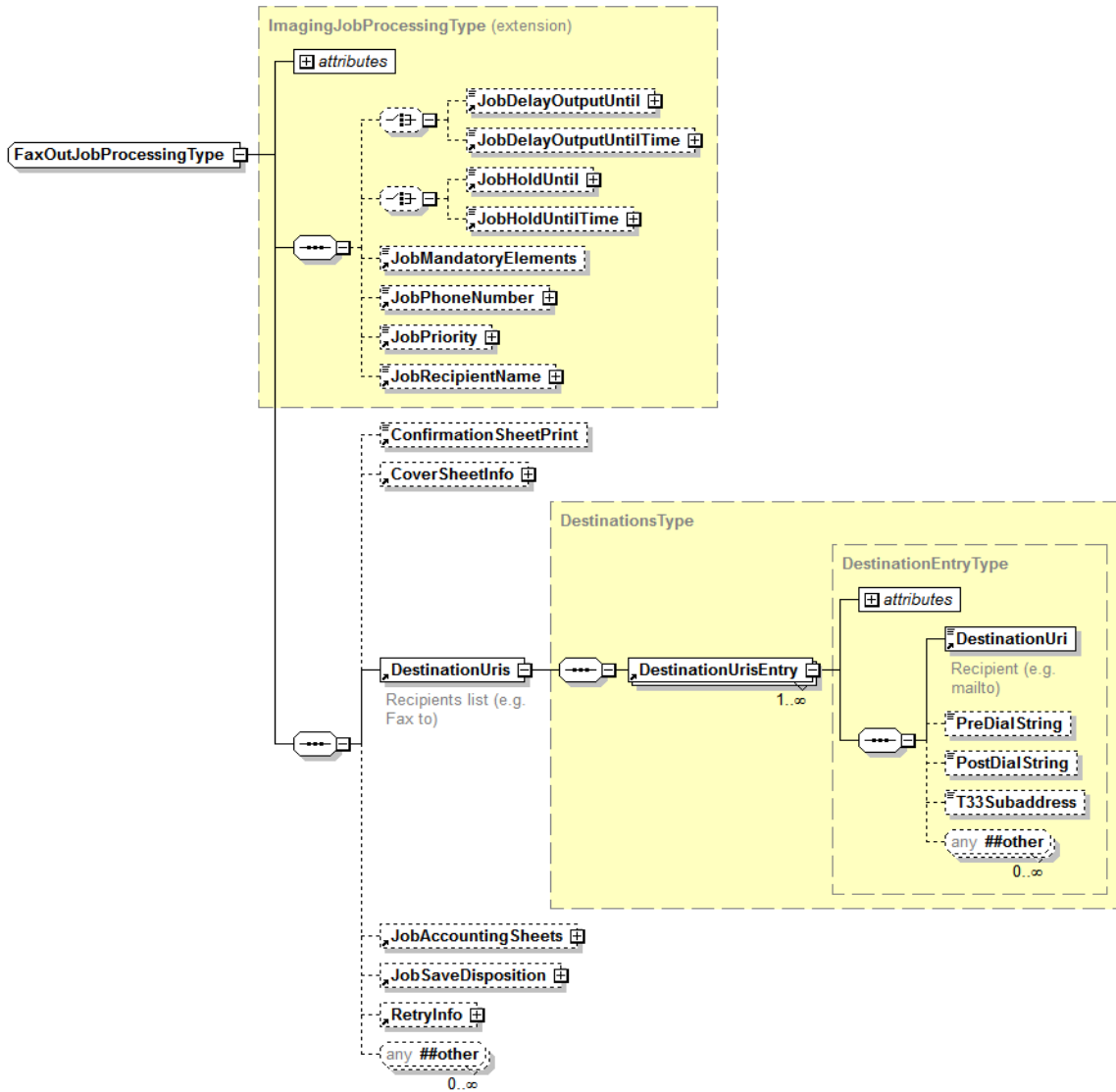
**Figure 12 FaxOutJobDescription**

472  
473  
474  
475  
476  
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481

The elements common to all Job Descriptions are described in the MFD Model and Common Semantics specification [PWG5108.01]. Those elements are identified in Figure 12 by being included in the yellow box. The remaining elements are common elements used by FaxOut. These elements are also described in the MFD Model and Common Semantics specification [PWG5108.01].

### 7.3.3 FaxOutJobProcessing

The FaxOutJobProcessing provides the job processing instructions that have been requested by the End User. Each element has a MustHonor attribute. When the value of MustHonor is true, the FaxOutService does not process the job unless the element is supported; otherwise the FaxOutService processes the job with its best effort.



482  
483  
484

Figure 13 FaxOutJobProcessing

The elements common to all <service>JobProcessing are described in the MFD Model and Common Semantics specification [PWG5108.01]. Those elements are identified in Figure 13 by being included in the yellow box. The DestinationUri element is FaxouOutService specific and is described in the next section. The remaining elements are common elements used by FaxOut. These elements are also described in the MFD Model and Common Semantics specification [PWG5108.01].

490 **7.3.3.1 DestinationUris**

491 This FaxOutJobProcessing element specifies destinations for the Fax transmission. It is a sequence of  
 492 DestinationUriEntry each of which defines a single destination. The DestinationUri is an RFC3966 [RFC3966]  
 493 compliant URI. Dial Strings were dropped when RFC3966 superseded RFC2806 [RFC2806], "Dial strings" are the  
 494 actual numbers, symbols, and pauses entered by a user to place a phone call. We have added some elements to  
 495 contain the Dial String information even though they could be encoded as RFC3966 compliant parameters. The  
 496 PreDialString is the Dial string entered before the DestinationUri is applied. The PostDialString is the Dial string  
 497 entered after the DestinationUri is applied.

498 The ABNF for a Dial Sting that applies to a PreDialString and a PostDialString is given below.

```

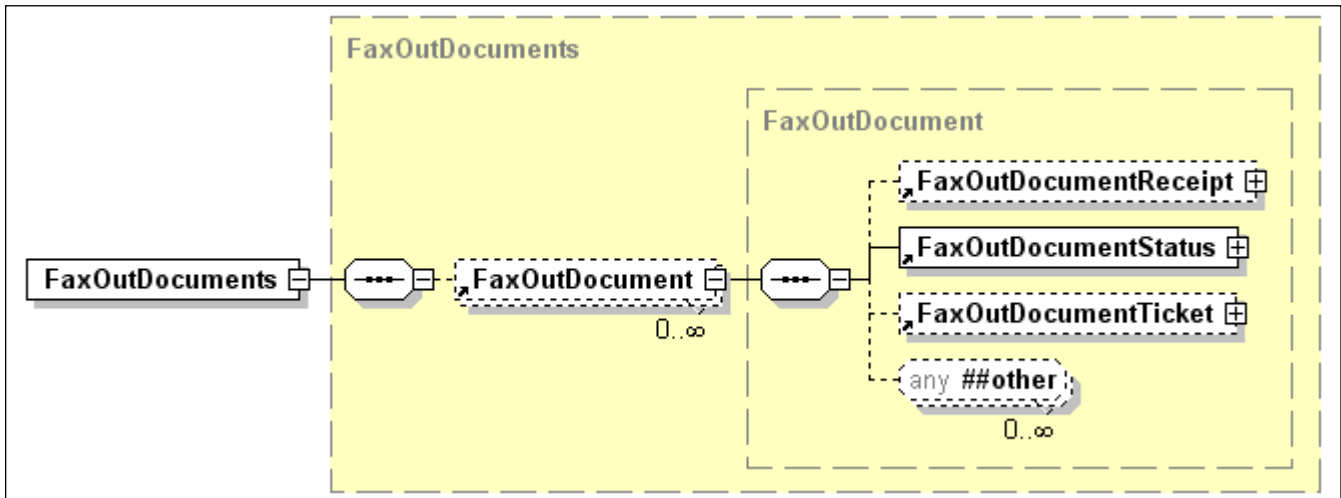
    499
    500 DialString      = 1*(phonedigit / dtmf-digit / pause-character)
    501 pause-character = one-second-pause / wait-for-dial-tone
    502 one-second-pause = "p"
    503 wait-for-dial-tone = "w"
    504 dtmf-digit      = "*" / "A" / "B" / "C" / "D" / "#"
    505 phonedigit      = DIGIT / [ visual-separator ]
    506 visual-separator = "-" / "." / "(" / ")" / "" / "(" / ")"
    507
    
```

508 The T33 subaddressing can be specified by the T33Subaddress element since a T33 subaddress can only contain  
 509 digits [RFC3192], the datatype for the T33Subaddress is an integer. Multiple T33 subaddresses are not supported  
 510 in a single DestinationUriEntry. If multiple mailboxes are to be addressed each one requires its own entry.

511 **8 FaxOutDocument Model**

512 Figure 14 is the top level view of the FaxOutDocument. FaxOutDocuments are associated with one FaxOutJob.  
 513 Note that PSTN FaxOut jobs either: (a) do not support multiple documents; or (b) do not distinguish the document  
 514 boundaries in the FaxOut transmission. Initial implementations MAY support multiple document jobs. The state of  
 515 the Document is described in the FaxOutDocumentStatus element. FaxOutJobTicket contains descriptive  
 516 information about the job and the Job and Document processing instructions. It is possible to override the  
 517 Document Processing instructions on a document by document basis by supplying a FaxOutDocumentTicket with  
 518 the FaxOutDocument. The FaxOutJobTicket and FaxOutDocumentTicket represent the End User's intent while  
 519 the Job Receipt and Document Receipt represent what the FaxOutService actually did.

520



521

522 **Figure 14 High Level FaxOutDocument View**

523



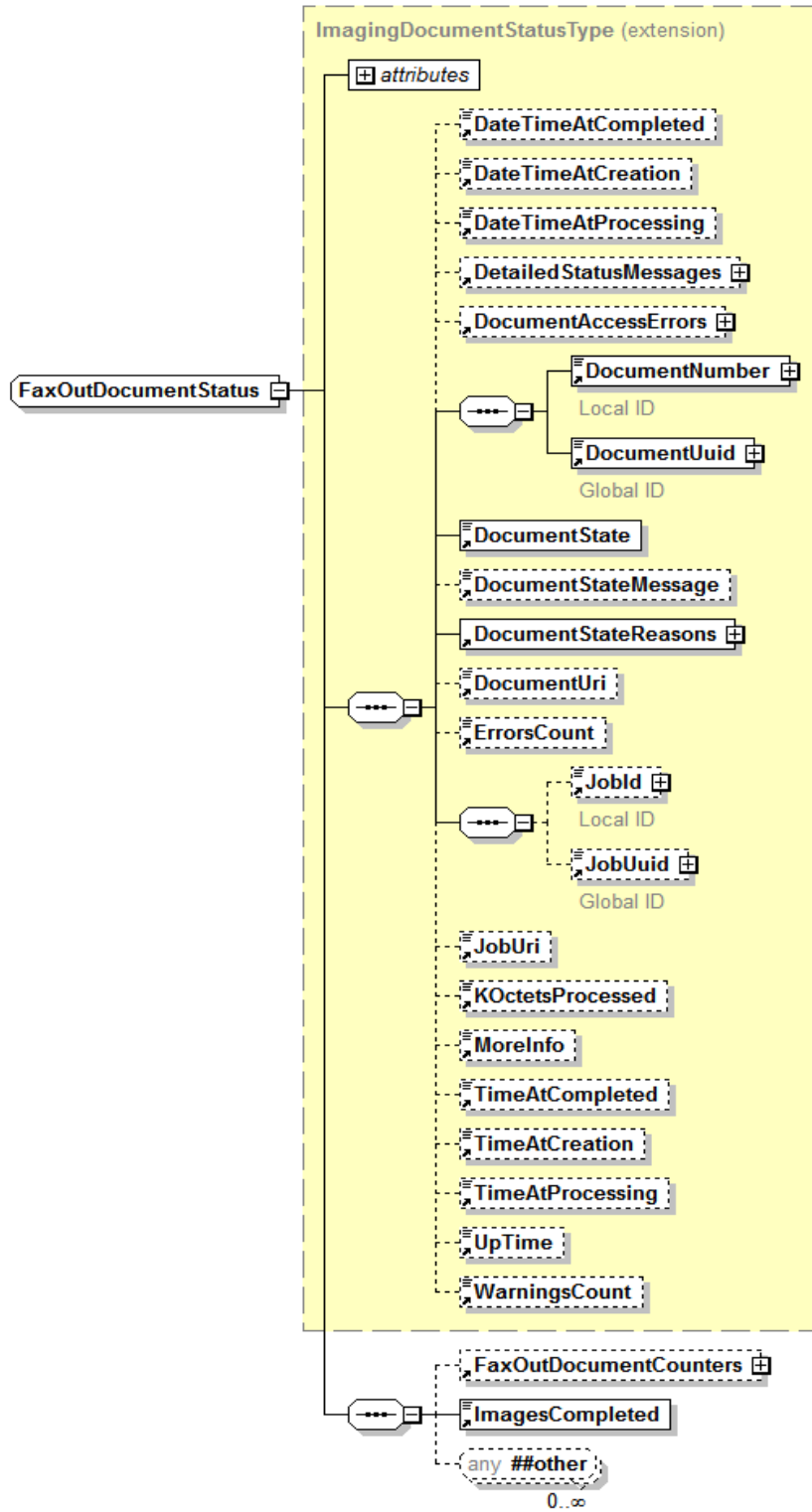
**524 8.1 FaxOutDocumentReceipt**

525 This element has exactly the same structure as the FaxOutDocumentTicket. For each processing element of a  
526 FaxOutDocument, it records the actual value used by the FaxOutService for processing the FaxOutDocument. It  
527 contains the elements supplied by the FaxOut Client, Any substitutions made by the FaxOutService and any  
528 Default elements applied by the FaxOutService. See §8.3 for element descriptions.

**529 8.2 FaxOutDocumentStatus**

530 Figure 15 is a view of the Status elements for the FaxOutDocument. The Status elements provide state  
531 information for the FaxOutDocument. The elements are maintained by automata and cannot be directly set.

532  
533



534

535

536

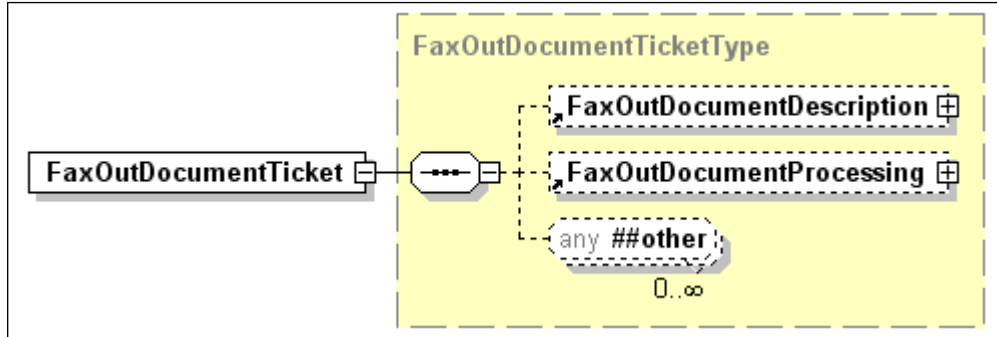
Figure 15 FaxOutDocumentStatus

537

538 The elements common to all <service>DocumentStatus are described in the MFD Model and Common Semantics  
 539 specification [PWG5108.01]. Those elements are identified in Figure 15 by being included in the yellow box. The  
 540 remaining elements are common elements used by FaxOut. These elements are described in the MFD Model and  
 541 Common Semantics specification [PWG5108.01]

542 **8.3 FaxOutDocumentTicket**

543 The FaxOutDocumentTicket contains description and processing elements provided by the FaxOut Client during  
 544 FaxOutDocument creation. This information is used by the FaxOutService during the processing of a  
 545 FaxOutDocument. This information is made available to FaxOut Clients through the GetFaxOutDocumentElements  
 546 operation.



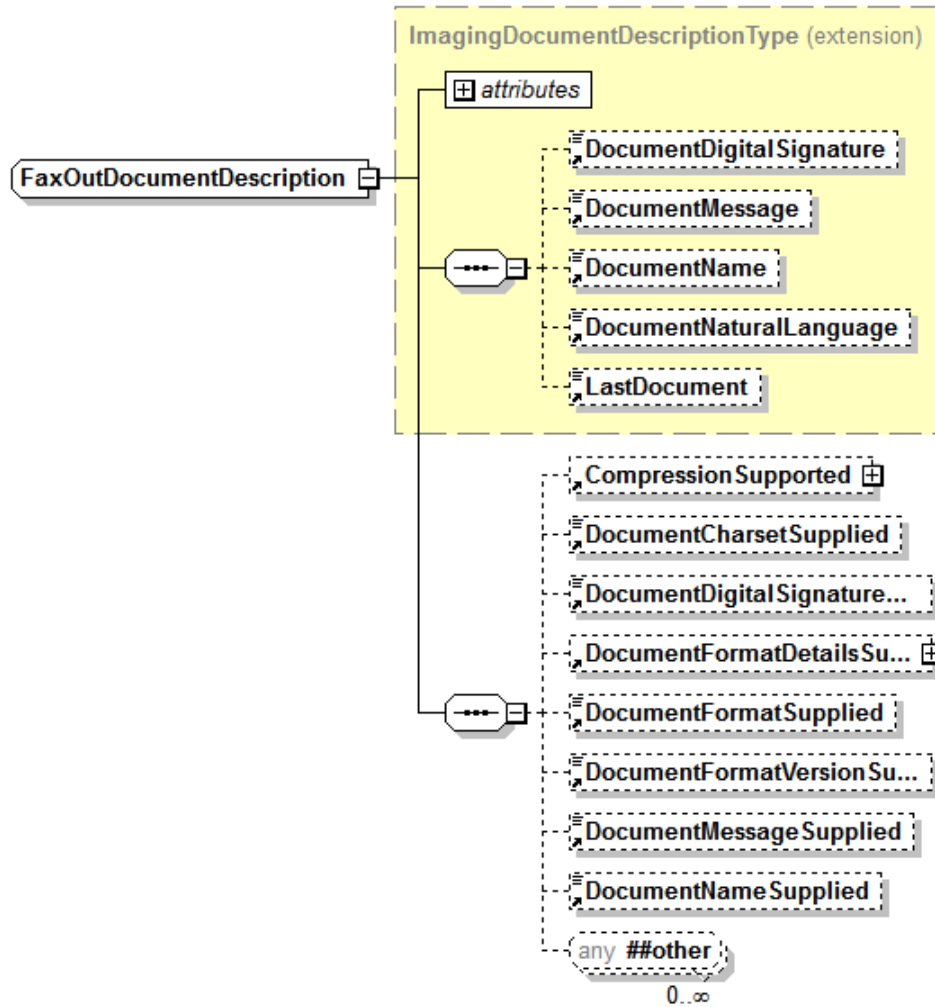
547

548 **Figure 16 FaxOutDocumentTicket**

549

550 **8.3.1 FaxOutDocumentDescription**

551 Figure 17 is a view of the Description elements for the FaxOutDocument. These elements are set by the FaxOut  
 552 Client during Document creation.



553

554 **Figure 17 FaxOutDocumentDescription**

555

556

557 The elements common to all <service>DocumentDescription are described in the MFD Model and Common  
 558 Semantics specification [PWG5108.01]. Those elements are identified in Figure 17 by being included in the yellow  
 559 box. The only other element included is the standard extension point.

560 **8.3.2 FaxOutDocumentProcessing**

561 This Group Element has exactly the same structure as the FaxOutDocumentProcessing element of FaxOutJob  
 562 (See **Error! Reference source not found.**). It provides the document processing instructions that have been  
 563 requested by the End User at each document level, overriding the job level document processing instructions.

564 **9 FaxOutService Interfaces**

565 The FaxOutService provides a set of service interfaces that is the same for a co-located local FaxOut Client or a  
 566 remote FaxOut Client via a local interface, a local area network, or the Internet. A user makes a FaxOutService

567 request by interacting directly with the FaxOutService or indirectly through a local FaxOut Client via the MFD UI or  
 568 a remote FaxOut Client via its software application UI.

569  
 570 The requests parameters are summarized in Table 2, Table 3 and Table 4. Responses to operations that fail are  
 571 expected to return a fault.

572  
 573 The semantics for these operations are the same as the operations specified in the MFD Model and Common  
 574 Semantics specification [PWG5108.01]. In in Table 2, Table 3 and Table 4 the required parameters are in **bold**  
 575 and optional parameters are in *italic* font.

576

577

**Table 2 Mandatory User Operations**

User Operation Name	Input Parameters	Output Parameters
AddFaxOutHardCopyDocument	<b>InputSource, JobId,</b> <i>ElementsNaturalLanguage,</i> <i>FaxOutDocumentTicket, LastDocument,</i> <b>RequestingUserName</b>	<b>DocumentNumber,</b> <i>UnsupportedAttributes</i>
CancelFaxOutJob	<i>ElementsNaturalLanguage, JobId,</i> <i>Message, RequestingUserName</i>	
CloseFaxOutJob	<b>JobId, RequestingUserName</b>	
CreateFaxOutJob	<i>ElementsNaturalLanguage,</i> <i>FaxOutJobTicket, RequestingUserName</i>	<b>JobId,</b> <i>UnsupportedElements</i>
GetActiveFaxOutJobs	<i>ElementsNaturalLanguageRequested, limit,</i> <b>RequestingUserName</b>	<b>ActiveJobs(list of</b> <b>JobSummary),</b> <i>ElementsNaturalLanguage</i>
GetFaxOutJobElements	<i>ElementsNaturalLanguageRequested,</i> <b>JobId, RequestedElements,</b> <b>RequestingUserName</b>	<i>FaxOutJobElements,</i> <i>ElementsNaturalLanguage</i>
GetFaxOutJobHistory	<i>ElementsNaturalLanguageRequested, limit,</i> <b>RequestingUserName</b>	<b>JobHistory(list of</b> <b>JobSummary),</b> <i>ElementsNaturalLanguage</i>
GetFaxOutServiceElements	<i>ElementsNaturalLanguageRequested,</i> <i>RequestedElements,</i> <b>RequestingUserName</b>	<i>ElementsNaturalLanguage,</i> <i>FaxOutServiceElements</i>
SendFaxOutDocument	<i>ElementsNaturalLanguageRequested,</i> <i>FaxOutDocumentTicket, JobId,</i> <i>LastDocument, RequestingUserName,</i> <b>DocumentData</b>	<b>DocumentNumber,</b> <i>UnsupportedAttributes</i>
ValidateFaxOutJobTicket	<i>ElementsNaturalLanguage,</i> <b>FaxOutJobTicket, RequestingUserName</b>	<i>UnsupportedAttributes</i>

578

579

**Table 3 Optional User Operations**

User Operation Name	Input Parameters	Output Parameters
CancelCurrentFaxOutJob	<i>ElementsNaturalLanguage, JobId,</i> <i>Message, RequestingUserName</i>	
CancelFaxOutDocuments	<b>DocumentNumber,</b> <i>ElementsNaturalLanguage, JobId,</i> <i>Message, RequestingUserName</i>	

User Operation Name	Input Parameters	Output Parameters
CancelMyFaxOutJobs	<i>ElementsNaturalLanguage, Joblds, Message, RequestingUserName</i>	<i>Joblds</i>
GetFaxOutDocumentElements	<b>DocumentNumber,</b> <i>ElementsNaturalLanguageRequested, Jobld, RequestedElements, RequestingUserName</i>	<i>FaxOutDocumentElements, ElementsNaturalLanguage</i>
GetFaxOutDocuments	<i>ElementsNaturalLanguageRequested, Jobld, RequestingUserName</i>	<b>Documents(List of DocumentSummary),</b> <i>ElementsNaturalLanguage, Jobld, JobName</i>
HoldFaxOutJob	<i>ElementsNaturalLanguage, JobHoldUntil   JobHoldUntilTime, Jobld, Message, RequestingUserName</i>	
ReleaseFaxOutJob	<i>ElementsNaturalLanguage, Jobld, Message, RequestingUserName</i>	
ResubmitFaxOutJob	<i>ElementsNaturalLanguage, FaxOutJobTicket, Jobld, RequestingUserName</i>	<b>Jobld, UnsupportedElements</b>
ResumeFaxOutJob	<i>ElementsNaturalLanguage, Jobld, Message, RequestingUserName</i>	
SendFaxOutUri	<b>DocumentUri,</b> <i>ElementsNaturalLanguageRequested, FaxOutDocumentTicket, Jobld, LastDocument, RequestingUserName</i>	<b>DocumentNumber, UnsupportedAttributes</b>
SetFaxOutDocumentElements	<b>DocumentNumber,</b> <i>ElementsNaturalLanguage, FaxOutDocumentTicket, Jobld, Message, RequestingUserName</i>	<i>UnsupportedElements</i>
SetFaxOutJobElements	<i>ElementsNaturalLanguage, FaxOutJobTicket, Jobld, Message, RequestingUserName</i>	<i>UnsupportedElements</i>
SuspendCurrentFaxOutJob	<i>ElementsNaturalLanguage, Jobld, Message, RequestingUserName</i>	
ValidateFaxOutDocumentTicket	<i>ElementsNaturalLanguage, FaxOutDocumentTicket, RequestingUserName</i>	<i>UnsupportedElements</i>

580

**Table 4 Administrative Operations**

Administrative Operation Name	Input Parameters	Output Parameters
CancelFaxOutJobs	<i>ElementsNaturalLanguage, Joblds, Message, RequestingUserName</i>	<i>Joblds</i>
DisableFaxOutService	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	
EnableFaxOutService	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	
HoldNewFaxOutJobs	<i>ElementsNaturalLanguage, JobHoldUntil   JobHoldUntilTime, Message, RequestingUserName</i>	

Administrative Operation Name	Input Parameters	Output Parameters
PauseFaxOutService	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	
PauseFaxOutServiceAfterCurrentJob	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	
PromoteFaxOutJob	<i>ElementsNaturalLanguage, JobId, Message, PredecessorJobId, RequestingUserName</i>	
ReleaseNewFaxOutJobs	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	
RestartFaxOutService	<i>ElementsNaturalLanguage, IsAcceptingJobs, Message, RequestingUserName, StartServicePaused</i>	
ResumeFaxOutService	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	
SetFaxOutServiceElements	<i>ElementsNaturalLanguage, FaxOutServiceElements, Message, RequestingUserName</i>	<i>UnsupportedElements</i>
ShutdownFaxOutService	<i>ElementsNaturalLanguage, Message, RequestingUserName</i>	

581

## 582 10 Conformance Requirements

583 This section describes conformance issues and requirements. This document introduces model entities such as  
 584 objects, operations, elements, element syntaxes, and element values. These conformance sections describe the  
 585 conformance requirements which apply to these model entities.

### 586 10.1 Client Conformance Requirements

587 A conforming FaxOut Client **MUST** support all **REQUIRED** operations as defined in this document. For each  
 588 parameter included in an operation request, a conforming FaxOut Client **MUST** supply a value whose type and  
 589 value syntax conforms to the requirements as specified in Section 5. A conforming FaxOut Client **MAY** supply any  
 590 extensions in an operation request, as long as they meet the requirements in Section 10.4.

591 When sending a request, a conforming FaxOut Client **MAY** supply any parameters that are indicated as  
 592 **OPTIONALLY** supplied by the FaxOut Client .

593 A FaxOut Client **MUST** be able to accept any of the elements defined in the model, including their full range that  
 594 may be returned to it in a response from a FaxOutService

595 An operation response can contain elements and/or values that the FaxOut Client does not expect. Therefore, a  
 596 FaxOut Client implementation **MUST** gracefully handle such responses and not refuse to interoperate with a  
 597 conforming FaxOutService that is returning extended elements and/or values that conform to Section 10.4 . FaxOut  
 598 Client s may choose to ignore any parameters, elements, or values that they do not understand.

### 599 10.2 FaxOutService Conformance Requirements

600 This section specifies the conformance requirements for conforming implementations with respect to objects,  
 601 operations, and attributes.

#### 602 10.2.1 Objects

603 Conforming implementations **MUST** implement all of the **REQUIRED** model objects as defined in this specification  
 604 in the indicated sections:

605 Section 6 - FaxOutService  
 606 Section 7 - FaxOutJob  
 607 Section 8 - FaxOutDocument

## 608 10.2.2 Operations

609 Conforming FaxOutService implementations MUST implement all of the REQUIRED model operations, including  
 610 REQUIRED responses, as defined in this specification in section 9:

CreateFaxOutJob	AddFaxOutHardCopyDocument	SendFaxOutDocument
CloseFaxOutJob	GetActiveFaxOutJobs	GetFaxOutServiceElements
CancelFaxOutJob	GetFaxOutJobHistory	GetFaxOutJobElements
ValidateFaxOutJobTicket		

611 Conforming FaxOutService MUST support all REQUIRED operation elements and all values of such elements if so  
 612 indicated in the description. Conforming FaxOutService MUST ignore all unsupported or unknown operation  
 613 elements received in a request, but MUST reject a CreateFaxOutJob request that contains an unknown element  
 614 that contains the MustHonor attribute with a value of 'true'. Note that PSTN FaxOut jobs either: (a) do not support  
 615 multiple documents; or (b) do not distinguish the document boundaries in the FaxOut transmission.

## 616 10.2.3 Job History

617 Conforming FaxOutService implementations MUST retain every Job in the JobHistory for at least 300 seconds (see  
 618 section 7). Before a Job can be deleted from the JobHistory, the Job metadata (e.g., JobId,  
 619 DateTimeAtCompleted, JobOriginatingUserName, DestinationUris) MUST be durably logged.

## 620 10.3 FaxOutService Elements

621 Conforming FaxOutService MUST support all of the REQUIRED object elements, as defined in this specification.

622 If an object supports an element, it MUST support only those values specified in this document or through the  
 623 extension mechanism described in section 10.4. It MAY support any non-empty subset of these values. That is, it  
 624 MUST support at least one of the specified values and at most all of them.

## 625 10.4 Extensions

626 Conforming FaxOutService MAY support extensions. To extend the model the extensions MUST be fully qualified.  
 627 The qualified name MUST NOT be in the PWG target namespace. When extending the model with new elements  
 628 the new elements MUST be added at the extension points at the end of the associated sequence of elements.  
 629 Extended values for elements MUST conform to the extension patterns defined in the element schema.  
 630 Implementers are free to add vendor specific operations to the service.

## 631 11 PWG and IANA Registration Considerations

632 This specification abides by the guidelines set forth in the MFD Model and Common Semantics specification  
 633 [PWG5108.01] (section 10).

## 634 12 Internalization Considerations

635 This specification abides by the guidelines set forth in the MFD Model and Common Semantics specification  
 636 [PWG5108.01] (section 11).



## 637 13 Security Considerations

### 638 13.1 Protection of End User's FaxIn Data

639 This specification abides by the guidelines set forth in the MFD Model and Common Semantics specification  
640 [PWG5108.01] (section 12).

641  
642 An end user's FaxIn data can be protected from disclosure by encrypting the content and protected from  
643 modification by signing the data file when the data is stored in a repository or being transmitted over a  
644 communication link.

645  
646 Signing or encrypting data files stored in a repository requires secure key management which includes the  
647 selection, generation, distribution, and destruction of effective signing or encryption of each end user's keys.  
648 Signing or encrypting data files stored in a repository is outside the scope of the FaxInService. It is  
649 RECOMMENDED that the end user designates a repository that has their desired level of signing or encryption  
650 capabilities if so is required.

651  
652 For protection of the data files transmitted over the network between a FaxInService and a repository, the  
653 FaxInService SHALL support the secure communication protocols required by the end user's site policy, which may  
654 require signing and/or encryption of the transmitted document. The FaxInService SHALL have security attributes to  
655 indicate the signing or encryption support for the end user's site policy. Different levels of security require different  
656 signing or encryption methods to be used. A site policy administrator SHOULD be responsible to manage the site  
657 security policy to ensure consistency with the site security requirements. The MFD implementer SHOULD ensure  
658 that a signing or encryption method consistent with the user's site policy is used for transporting user's FaxIn data  
659 over a shared communication medium.  
660

## 661 14 References

### 662 14.1 Normative References

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767