ICS

INTEROPERABILITY
CONFORMANCE
SPECIFICATION

Prepress to Conventional Printing ICS

Version: 1.7

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CIP4
ORGANIZATION

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1 Introduction

Because the JDF specification ▸[JDF 1.7] is quite large, it is unrealistic (and not very useful) for any **JDF** enabled product to implement the ▸[JDF 1.7] in full. Yet, if each **JDF** enabled product were to implement an arbitrary subset of the ▸[JDF 1.7], interoperability between **JDF** enabled products would be highly unlikely.

Hence, there is a need for a number of well specified subsets of **JDF**, each defining an interface between pairs of vendor's products in the workflow. The mechanism for specifying such a subset of **JDF** is the Interoperability Conformance Specification (ICS). An ICS defines a subset of **JDF** by means of *Conformance Requirements*, which are a set of requirements. When a **JDF** enabled product meets the *Manager Conformance Requirements* of a particular ICS, it achieves interoperability with other **JDF** enabled products that meet the corresponding *Worker Conformance Requirements* of the same ICS.
Note: The definitions of '*this type of term*' appear in ▸Section 1.4 Glossary.

1.1 Use of ICS Documents

CIP4's ICSs are designed for use in a particular product domain for which CIP4 supplies a domain specific ICS, e.g., ▸[Integrated Digital Printing ICS] or ▸[MIS to Prepress ICS].

The correct implementation of any domain ICS requires a common way to present data and to communicate between systems; this is the job of this ICS (i.e. the Base ICS), the ▸[Messaging ICS] and the ▸[Management Information System ICS]. These ICSs are not intended to be used in isolation and should always be used in conjunction with one or more domain ICS specifications.

1.2 Conventions Used in this Specification

Throughout this document a number of formatting and stylistic conventions have been employed that are intended to help the reader. These are intended to align with those of the **JDF** specification. See ▸[JDF 1.7].

1.2.1 Document References

References to other publications are collated in an appendix, e.g. ▸Appendix A References. Within the text these references use a meaningful short symbolic name that may be clicked to allow the reader to navigate directly to the full description in the appendix. These references use a common text style as described in the following section.

1.2.2 Text Styles

There are a number of text styles that are used to identify the various components of the specification. Some of the text styles support dynamic links; these allow the reader to click on the term and navigate to the definition of the term (if it is locally defined).

·	***Color***	A **JDF** or **JMF** element. Usually these are dynamic links leading to the definition of the element.
·	**Process**	A specific process such as **ColorSpaceConversion** or **Rendering**. These can be dynamic links leading to the definition of the process.
·	*@Attribute*	A **JDF** or **JMF** attribute within the context of an element.
·	"Value"	The content of an attribute.
·	**JDF**	**JDF** or **JMF** are used when referring to the specification in general rather than elements with the same name.
·	*Glossary Item*	The document utilizes some specialist terms; these are defined in ▸Table 1.2 Glossary and highlighted throughout the document.
·	▸[JDF 1.7]	Identifies a reference to an item within this specification (such as a particular table, section etc) or to an entry in the references appendix. These are dynamic links leading to the item itself.
·	http://www.CIP4.org	A hyperlink reference to an external item.

1.2.3 XPath Notation

·	*JDF*/*@JobID*	The document utilizes ▸[XPath] notation when it is required to define the particular context for an item. It is particularly useful when there is a conditional term relating to the context, e.g. *JDF*[*@Type* = "DigitalPrinting"] identifies a **JDF** process node for digital printing.

1.2.4 Specification of Cardinality

The following table illustrates the notation of *Manager* and *Worker Conformance Requirements* in ICS tables.

If an attribute, attribute value or element is not provided explicitly or implicitly by a table row of <all other values>, it is assumed to be out of scope. An empty cell for a *Conformance Level* specifies that the *Trait* is out of scope for that *Conformance Level*. Out of scope values MAY be written and MAY be processed, but a conforming processor NEED NOT support them. The implied cardinality of out of scope values is therefore w? r?.

Table 1.1: Specification of cardinality

NOTATION	NAME	DESCRIPTION
w	Write Required	When this cardinality indicator is applied to an attribute or element name, the *Trait* SHALL be written by the *Manager* or *Worker*. When this cardinality indicator is applied to an attribute value it specifies the only acceptable value.
w?	Write Optional	The element, or attribute, or attribute value MAY be written by the *Manager* or *Worker*.
w←	Write Conditional	When this cardinality indicator is applied to an attribute or element name, the *Trait* SHALL be written by the *Manager* or *Worker* depending on conditions. The details of the condition will be specified in the description. When this cardinality indicator is applied to an attribute value it specifies that the value is a valid selection from a list of acceptable values.
w!	Write Forbidden	The element, or attribute, or attribute value SHALL NOT be written by the *Manager* or *Worker*.
r	Read Required	The element, or attribute, or attribute value SHALL be read by the *Manager* or *Worker*.
r?	Read Optional	The element, or attribute, or attribute value MAY be read by the *Manager* or *Worker*.
r←	Read Conditional	The element, or attribute, or attribute value SHALL be read by the *Manager* or *Worker* depending on conditions. The details of the condition will be specified in the description.

1.2.5 Conformance Terminology

This document uses exactly the same terminology as the **JDF** specification to indicate the strictness of conformance. See ▸ [JDF 1.7].

1.3 Certification

CIP4 no longer provides certification for ICSs. Vendors are encouraged to certify their products by ensuring that all requirements laid out in the respective ICS are met. Additional hints for self certification are provided in the descriptions and are marked with the label "**Conformance Test:**".

In addition to self certification, vendors are encouraged to verify the interoperability of their products with other vendor's products that also comply with a given ICS and to publish the results in the CIP4 ▸ [Interoperability Matrix].

1.4 Glossary

This section defines terminology used throughout this document. References to other documents are indicated with square brackets, e.g. ▸ [JDF 1.7].

Table 1.2: Glossary (Sheet 1 of 2)

TERM	DEFINITION
Actual Name	The 'real' name of the color used on the press and in the PDF file.
Conformance Test	See ▸ [JDF 1.7].
Device	See ▸ [JDF 1.7].

Table 1.2: Glossary (Sheet 2 of 2)

TERM	DEFINITION
Hot Folder	A folder that is watched by the *Worker*, so that when the *Manager* writes a file into the *Hot Folder*, the *Worker* interprets that action as a job submission and attempts to perform the actions specified by the **JDF** or **JMF** contained in the file.
Manager	In the context of this ICS the *Manager* is a *Prepress Workflow System*.
MIS	See ▸ [Management Information System ICS].
Prepress Workflow System	The software that sends **JDF** instances, **JMF** messages and other data to a *Worker* with an expectation that the *Worker* appropriately processes the data and attempts to complete the work described. The *Manager* MAY receive information back (possibly via the network) from a *Worker* in a *Device*. It is the *Manager* for this ICS.
Press Controller	A *Device* that controls the press devices and handles all the communication via **JDF** and **JMF**. It typically communicates with an *MIS* and a *Gray Box.* It is the *Worker* for this ICS.
Process	See ▸ [JDF 1.7].
Producer	A *Manager* or *Worker* in a role where it produces or modifies either a **JDF** or a **JMF**.
Trait	In the context of an element, a single sub-element of it, a single attribute of it or a single value of one of its attributes. In the context of the specification, a table for an element contains all *Traits* of the element.
Worker	In the context of this ICS the *Worker* is a *Press Controller*.
Workstep	See ▸ [JDF 1.7].

2 Conformance

2.1 Conformance Levels

This ICS defines two *Conformance Levels*, namely levels 1 and 2, for defining a Conventional Printing node in a JDF instance created by a Prepress System. ▸ Table 2.1 Conformance Levels briefly describes the levels of conformance defined by this ICS.

In order to be conformant to a level of this ICS specified in the first column of ▸ Table 2.1 Conformance Levels, an *MIS* acting as a *Manager* SHALL conform to the *Manager* part; a *Device* acting as a *Worker* (in a *Conventional Press Controller* for a *Sheet Fed Offset Printing Press*) SHALL conform to the *Worker* part of this ICS. In addition the *Manager* or *Worker* SHALL conform to the level of the other ICSs specified in the second, third and forth columns of ▸ Table 2.1 Conformance Levels.

The column heading, ICS and reference are:

- · BASE   Base ICS   ▸ [Base ICS]
- · JMF   Messaging ICS   ▸ [Messaging ICS]
- · MIS   MIS ICS   ▸ [Management Information System ICS]

Table 2.1: Conformance Levels

LEVEL OF THIS ICS	BASE	JMF	MIS	DESCRIPTION
1	1	–	–	
2	1	–	–1	Level 2 is mainly for versioning and support of **JMF** communication with an *MIS*.

3 JDF Instance

3.1 JDF

▸ Table 3.1 JDF Node specifies the *Conformance Requirements* for attributes and elements for a **JDF** node, whether it is a root node or a subnode. Most of the attributes and elements have the same *Conformance Requirements* in either case, those that differ are marked with 'w←' and the 'Description' column specifies the conditions.

Table 3.1: JDF Node (Sheet 1 of 3)

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	
Activation	w?	w?	w?	r	r	r	See ▸ [JDF 1.7].
Active	w←	w←	w←	r	r	r	See ▸ [JDF 1.7].
<all other values>	w?	w?	w?	r?	r?	r?	Values other than "Active" NEED NOT be supported. **Note:** This allows *Workers* to immediately begin processing.
DescriptiveName	w←	w←	w←	r?	r?	r?	@*DescriptiveName* SHOULD occur in the root node, indicating a single line job title and MAY occur in **JDF** subnodes with other values. If the *Worker* identifies the node to an operator, it SHOULD include the @*DescriptiveName* in any such identification. **Note:** Many *Devices* have limited possibilities to display the job description. The string value SHOULD be as short as possible.
ICSVersions	w←	w←	w←	r?	r?	r?	@*ICSVersions* SHALL occur in the root node and MAY occur in subnodes. Each ICS specifies only the unique NMTOKEN value(s) that pertain to its domain, even if the ICS requires other ICSs to be supported.
Base_L0-1.7	w			r?	r?	r?	Specifies that the **JDF** conforms to *Conformance Level* 0 of this ICS. It SHALL only be specified if unidirectional **JDF** is acceptable to the *Manager*.
Base_L1-1.7		w		r?	r?	r?	Specifies that the **JDF** conforms to *Conformance Level* 1 of this ICS.
Base_L2-1.7			w	r?	r?	r?	Specifies that the **JDF** conforms to *Conformance Level* 2 of this ICS.
<all other values>	w←	w←	w←	r?	r?	r?	Values specified in other ICS documents.
ID	w	w r?	w r?	r?	r? w←	r? w←	@*ID* SHALL be specified if a new **JDF** node is created. Once specified it SHALL NOT be modified.

Table 3.1: JDF Node (Sheet 2 of 3)

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	
JobID	w←	w←	w←	r?	r?	r?	@*JobID* SHALL occur in the **JDF** root node and MAY occur in subnodes. **Conformance Test:** The *Worker* SHALL preserve @*JobID* values, and SHALL use this value when sending **Messages** that require the node's @*JobID* and SHALL use this value to identify jobs that are specified in received **Messages**.
JobPartID	w	w r?	w r?	r?	r? w←	r? w←	Each **JDF** node (Product, Process Group, Combined Process, and Process) SHALL have a @*JobPartID* and its value SHALL be unique within the context of all **JDF** instances that have the same @*JobID* in the print shop's workflow. When creating a **JDF** subnode, a *Worker* SHALL generate the new @*JobPartID* by adding a suffix to the parent **JDF** node's @*JobPartID*. Each suffix SHALL start with a period "." and SHALL NOT exceed three characters including the period. The resulting @*JobPartID* SHALL NOT exceed sixty three characters. **Note:** @*JobPartID* is required even at the root level. **Conformance Test:** The *Worker* SHALL preserve @*JobPartID* values and SHALL use this value when sending **Messages** that require the node's @*JobPartID* and SHALL use this value to identify nodes that are specified in received **Messages**.
MaxVersion	w←	w←	w←	r?	r?	r?	@*MaxVersion* SHALL be specified in the root node and MAY be specified in subnodes. **Conformance Test:** The returned **JDF** node contains no elements or attributes from newer versions of **JDF** than the specified version.
1.0 … 1.6	w!	w!	w!	r?	r?	r?	Values lower than "1.7" SHALL NOT be specified.
1.7 … 1.n	w←	w←	w←	r?	r?	r?	A value of "1.7" is the minimum required for conformance to this ICS. Higher values that define a higher version of **JDF** MAY be specified.
Status	w	w r?	w r?	r?	r? w	r? w	See ▸ [JDF 1.7] for details of the **JDF** node and the 'Execution Model'. **Conformance Test:** A *Worker* SHALL NOT execute nodes whose status is "Completed" or "Aborted".
Pool	w!	w!	w!	w!	w!	w!	**Note:** "Pool" has been deprecated and SHALL no longer be provided.
<all other values>	w←	w← r?	w← r?	r?	r? w←	r? w←	See ▸ [JDF 1.7].
Type	w	w	w	r?	r?	r?	Domain ICSs MAY specify stricter read requirements if necessary.
Version	w←	w← r?	w← r?	r?	r? w←	r? w←	@*Version* SHALL be in the root node and MAY be in subnodes.

Table 3.1: JDF Node (Sheet 3 of 3)

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	
1.7	w	w r?	w r?	r?	r? w	r? w	See ▸ [JDF 1.7].
<all other values>	w!	w! r?	w! r?	r?	r? w!	r? w!	
JDF	w?	w?	w?	r	r	r	See ▸ [JDF 1.7].
CustomerInfo	w!	w!	w!	w!	w!	w!	If required, use *CustomerInfo* resources as defined in **JDF** 1.3 and above.
NodeInfo	w!	w!	w!	w!	w!	w!	If required, use *NodeInfo* resources as defined in **JDF** 1.3 and above.
StatusPool	w!	w!	w!	w!	w!	w!	If required, use partitioned *NodeInfo* resources, as defined in **JDF** 1.3 and above, for reporting partial status.

4 Messages

4.1 Resource

4.1.1 Command - Resource

Table 4.1: Resource Command Message

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	

4.1.1.1 ResourceCmdParams

Table 4.2: ResourceCmdParams Element

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	

4.1.1.2 Part

Table 4.3: Part Element

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	

4.1.2 Response - Resource

Table 4.4: Resource Response Message

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	0	1	2	0	1	2	

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5 Resources

5.1 Resource

Table 5.1: Abstract Resource Element

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	1	2	3	1	2	3	

5.2 Color

5.3 ColorantControl

5.4 ColorPool

5.5 ExposedMedia

5.6 Media

5.7 Preview

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6 Partitioning Summary

6.1 Resource

Table 6.1: Abstract Resource Element

NAME OR VALUE	MANAGER LEVEL			WORKER LEVEL			DESCRIPTION
	1	2	3	1	2	3	

A References

Table A.1: References (Sheet 1 of 2)

TERM	DEFINITION
[Base ICS]	*Base ICS* Version: 1.7 Date: May 2021 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[Integrated Digital Printing ICS]	*Integrated Digital Printing ICS* Version: 1.7 Date: August 2021 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[Interoperability Matrix]	*CIP4 Interoperability Matrix* Date: August 2020 Produced by: CIP4 Organization Available via: http://www.CIP4.org Available at: CIP4 Interoperability Matrix
[JDF 1.7]	*Job Definition Format Specification* Version: 1.7 Date: August 2020 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[MIS to Prepress ICS]	*MIS to Prepress ICS* Version: 1.7 Date: May 2021 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[Management Information System ICS]	*Management Information System ICS* Version: 1.7 Date: August 2021 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[Messaging ICS]	*Messaging ICS* Version: 1.7 Date: May 2021 Produced by: CIP4 Organization Available at: http://www.CIP4.org
[RFC2387]	*RFC 2387* The MIME Multipart/Related Content-type Date: August 1998 Produced by: Internet Engineering Task Force (IETF), Network Working Group Available at: http://www.rfc-editor.org

Table A.1: References (Sheet 2 of 2)

TERM	DEFINITION
[RFC2392]	*RFC 2392* Content-ID and Message-ID Uniform Resource Locators Date: August 1998 Produced by: Internet Engineering Task Force (IETF), Network Working Group Available at: http://www.rfc-editor.org
[RFC3986]	*RFC 3986* *Uniform Resource Identifier (URI): Generic Syntax* by T. Berners-Lee, R. Fielding and L. Masinter Date: January 2005 Produced by: Internet Engineering Task Force (IETF), Network Working Group Available at: http://www.rfc-editor.org
[RFC3987]	*RFC 3987* *Internationalized Resource Identifiers (IRIs)* by M. Duerst and M. Suignard Date: January 2005 Produced by: Internet Engineering Task Force (IETF), Network Working Group Available at: http://www.rfc-editor.org
[XML Schema]	*XML Schema Part 0+1+2: Primer, Structures and Datatypes* *Version (W3C Recommendation of 28 Oct 2004)* Date: 28 October 2004 Produced by: World Wide Web Consortium (W3C) XML Schema working group Available at: http://www.w3.org/TR/xmlschema-0/ http://www.w3.org/TR/xmlschema-1/ http://www.w3.org/TR/xmlschema-2/
[XPath]	*XML Path Language (XPath) 2.0 (Second Edition)* *Version W3C Recommendation 14 December 2010* Date: 14 December 2010 Produced by: World Wide Web Consortium (W3C) Available at: https://www.w3.org/TR/xpath20/

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