

JDF – An Overview



CIP4TM
Organization



What you do **not** need to know about JDF¹

```
<JDF ID="n1" Status="Waiting" Type="Product" Version="1.2"/>
  <ResourcePool>
    <Layout Class="Parameter" ID="r112" Status="Unavailable">
      <Signature>
        <Sheet SurfaceContentsBox="0 0 1842.5197 1417.3228">
          <Surface Side="Front">
            <MarkObject CTM="1 0 0 1 42 66" Ord="0"/>
          </Surface>
        </Sheet>
      </Signature>
    </Layout>
  </ResourcePool>
</JDF>
```

%PDF-1.3

%âãïó

```
1 0 obj <</Type /Page /Parent 9 0 R /Resources 3 0 R /Contents 2 0 R
/BleedBox [ 0 0 635 881 ] /TrimBox [ 0 0 627 873 ] /Thumb 37 0 R >>
```

endobj

```
2 0 obj<</Length 698 /Filter /FlateDecode>>
```

stream

```
H%ìSMk1ýb: | ‡q, Ëöxzk6H; ì,,B(a°ùêîB³ ;ÿ³' ä™@sï!büPÓ³ 4úmžÀx, œ=
```



JDF Technology on One Slide



- JDF is a Graphic Arts Job Ticket
Data Interchange Format Specification
 - JDF is *not* an Application or System
- JDF is encoded in XML
- Content is referenced, not embedded
- JDF is extensible
- **JDF Job Definition + JMF Messaging + JDF Capabilities + ICS Documents** define the JDF Framework



JDF on Another 2 Slides

- Goals and Requirements -



- **Why JDF?**

- Automation increases Efficiency
- Digital information reduces errors compared to paper job jackets
- Information allows for informed decisions
- We have a digital content workflow with a paper based management workflow – there is room for improvement!



JDF on Another 2 Slides

- Goals and Requirements -



- **What does JDF enable?**

- Setup a Job in the graphic arts from the view point of:
 - Technical Applications
 - Management Information Systems
 - Customers
- Collect data that is relevant to a Job from origination to delivery
 - Business Data
 - Technical Data
- Realtime Job Tracking
- Comprehensively describe many areas of the graphic arts



Customer requirements for JDF

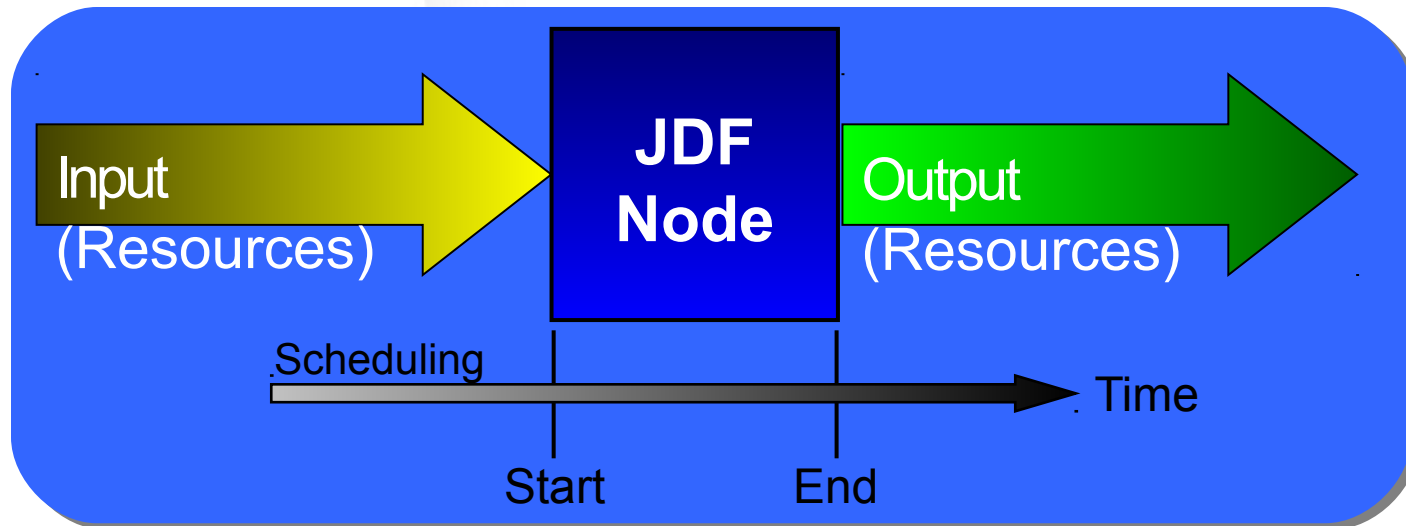
Customers can be either End Customer or business partner

- Describe the final product or the requested service
- Details may vary in detail from very rough to very detailed
- Allow price and contract negotiations
- Job Tracking
- Manage the approval cycle
- Change order Management



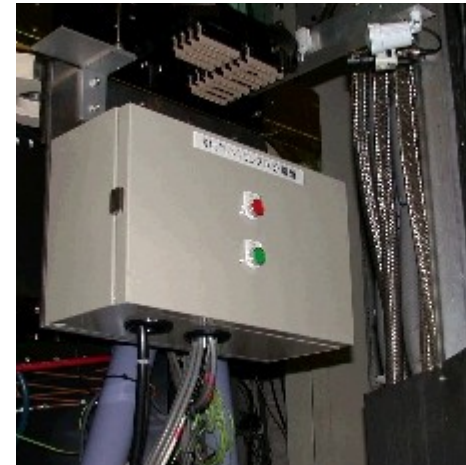
The JDF Node

- Description of a generic Process
 - The “Verb” in JDF
 - Do something at a given time
 - Structured container for Scheduling and Auditing
- One JDF node type for both Products and Processes



MIS View and Gray Boxes

- MIS has incomplete knowledge of a Process
 - It's only important if it affects the cost!
 - Thus, parameters not affecting costs are often unknown
 - Many MIS are “geometrically impaired”
- Manufacturing details are not all known
 - Prepress is seen as platemaking
 - RIP, Color management, trapping etc. are too beyond the scope of an typical MIS
 - Imposition may be roughly known
 - Number up
 - Sheet size
 - NO register mark positions
- Solution: Gray Boxes





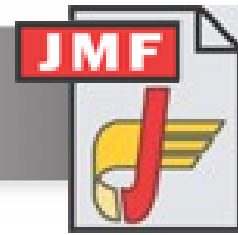
JDF Requirements for technical applications and devices

- Informationen for the device
 - Unambiguous setup data for the device
 - Container (or reference) to machine dependent setup data for repeat jobs
 - Fully automatic setup
 - Allow operator intervention
 - Dynamic modifications to running jobs



JDF Requirements for technical applications and devices

- Information from the device
 - Shop floor data collection
 - Container (or reference) to machine dependent setup data for future repeat jobs
 - Allow tracking of operator intervention
 - Track device or operator initiated modifications of job parameters



- ***Semi Real-time data interchange format***
 - Small XML structures
 - Used for:
 - Snapshots of Job / Device status
 - Dynamic job update (Change Orders)
 - Job submission and queue scheduling
 - Plug + Play bootstrapping (Future)
 - Generally used within an Intranet
 - Security issues are under development for JDF 1.4



JMF Status Signals

- Complete Tracking of Device Status over time
- Device sends JMF on:
 - Power up
 - Each Status change (begin of a new Phase)
 - Idle [-> Setup] -> Productive [-> Cleanup] -> Idle
 - Shift change, Operator Change
 - “Heartbeat” for long running jobs
 - Every N Seconds
 - Every M Copies of output
 - (Just before) Power down of the device



JMF Status Signal Definitions

- JobID, JobPartID, Part (e.g. SheetName, Separation...)
- Job Status: closed list with <10 values (Waiting, InProgress, Completed, Aborted...)
- Device Status: closed list with <10 values (Running, Down, Idle...)
- StatusDetails: Open List with initial list of predefined values
- List of active modules (# press modules, varnishing, ...)
- Operation Mode (Productive, Maintenance...)

Comparison of JMF and Audits



JMF

- References JDF Ticket
- (Quasi) Real time
- Current Status
- Job or Device Context
- Unproductive Times can be tracked
- Potentially incomplete
 - Network down



Audit

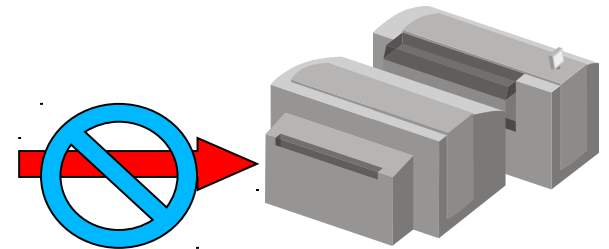
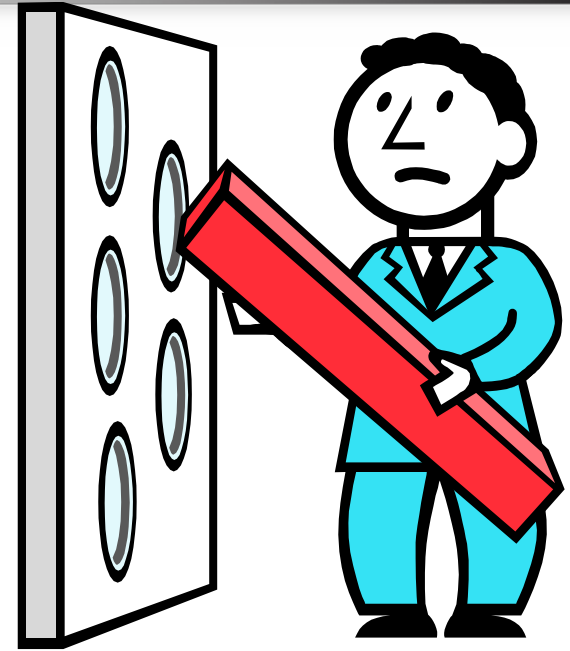
- Part of JDF Ticket
- After Job Completion
- Status Summary
- Only Job context
- Unproductive Times can NOT be tracked
- Complete for the job



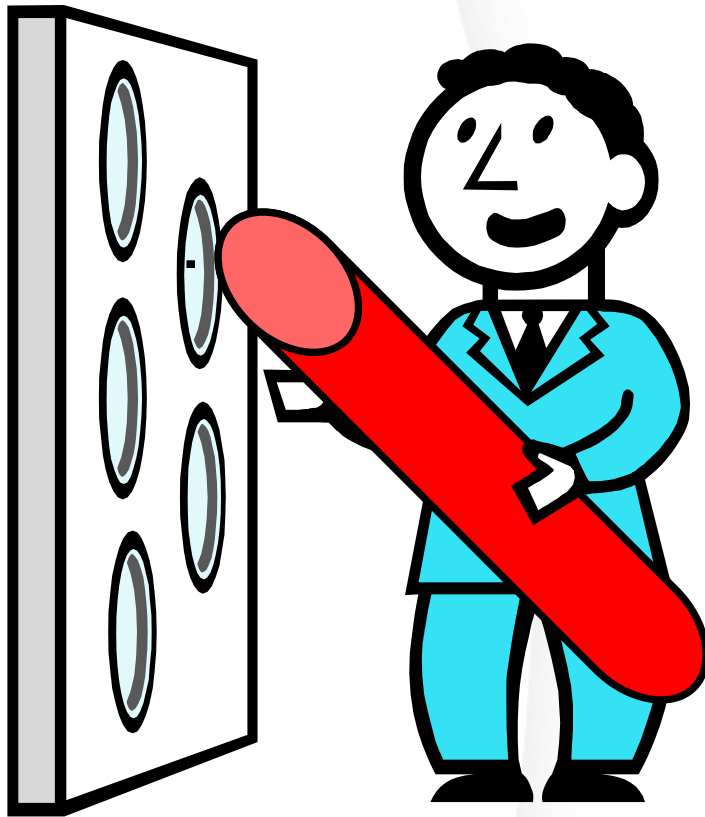
JDF Capabilities

It's all about
Interoperability !!!

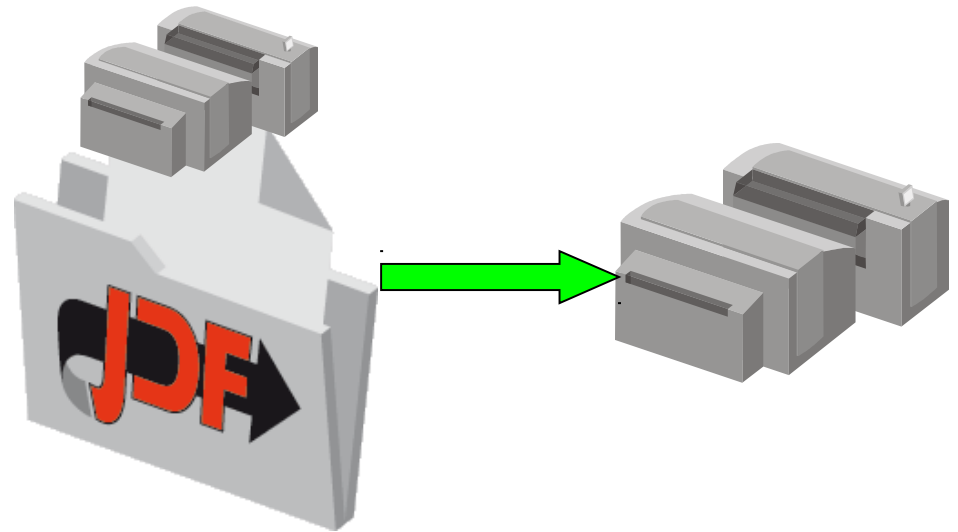
If you don't know about capabilities, you won't be able to "interoperate"...



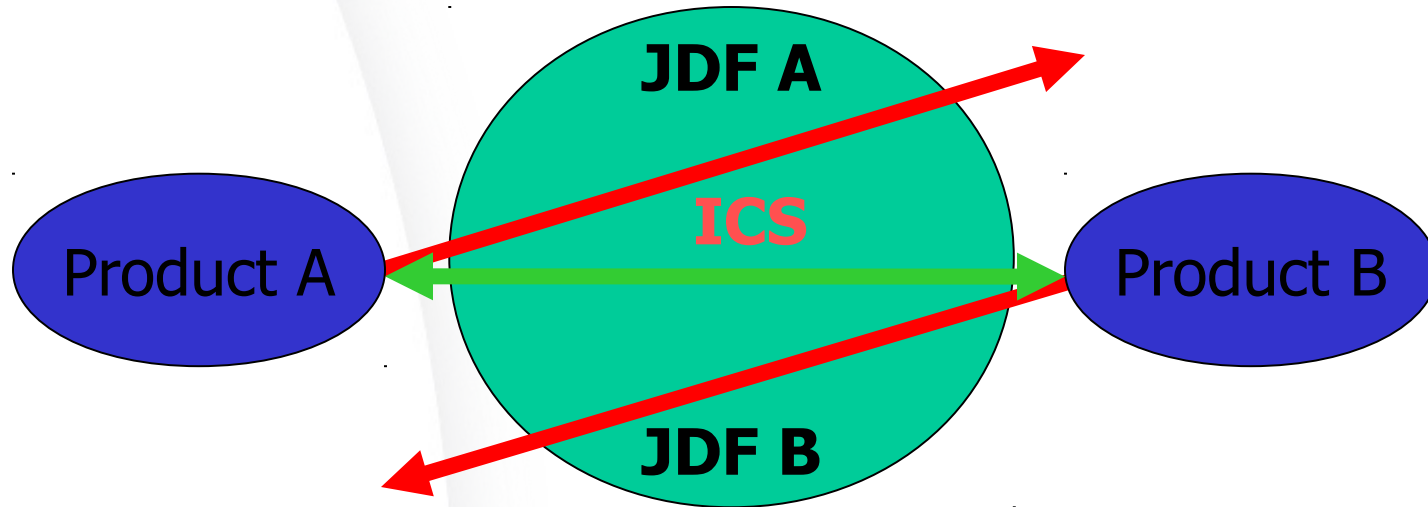
It's all about Interoperability!!



But if you do, you can use the right tools...



Why ICS ?



**Interoperability
Conformance
Specifications**



What is an MIS

Software TLAs:

- MIS: Management Information System
- ERP: Enterprise Resource Planning
- MES: Manufacturing Execution System
- PPS: Production Planning System
- ...
- Print MIS systems are all of the above
 - Specific for Print
 - Also provides information to management

- MIS is (possibly) the wrong term
 - MIS is a Role not always a single system
 - Main tasks:
 - Created **Quotations** to customers
 - Handles **Customer Order Entry**
 - Creates **Production Jobs** and **Job Tickets**
 - Does **Production Scheduling**
 - Handles **Material Logistics** (stock and purchasing)
 - Does **Job Tracking** and **Job Costing**
 - Includes **Invoicing (Billing)** and **Accounting**



JDF IPP Mapping Issues (30000 ft)

- Does IPP describe Intent or Process?
- Handling of Job Independent data
- Is IPP Unidirectional or Bidirectional?
- How are Media addressed and handled?
- Do IPP printers know to “Do what makes sense”
- Additional PWG work (Discovery,...)



Does IPP describe Intent or Process?

- What applications are generating IPP?
- How much information do the end users have?
-
- Do we send the definition of the business card or the sheet with 8 business cards?
- How are Gang jobs handled?
 - Cut & Stack (3D)
 - „Standard“ (2D)

Does IPP define:

- Capabilities exchange?
 - Glorified PPDs
- Database synchronization?
 - Paper Catalogs
 - Users



Is IPP Unidirectional or Bidirectional?

- Are we only sending jobs or are we getting information back?
 - How Often (Intermediate feedback: JMF)
 - When (only at end: Audits)
- What is the level of information?
 - Device details
 - Product Details



How are Media addressed and handled?

- “Whatever is in the selected tray”?
- All gory details via specific attributes?
- Reference by ID to a device-internally maintained paper catalog?



Do IPP printers know to “Do what makes sense”?

- Are context sensitive defaults supported?
 - Example: Does a Trim command combined with booklet making imply 3-sided Trimming, or do we have to specify which sides to trim?
- What is the anticipated command fidelity?



Additional PWG work (Discovery,...)

- Which Standards / Technologies should we discuss that can be leveraged by both groups.
- Discovery?



Where, when, who and how do we proceed?

- Dedicated IPP mapping meeting at CIP4 Interop in April (Vancouver BC, April 7-11 – WG date April 10)
- Next IPP Meeting
- Offline

JDF – A Technical Overview

Dr. Rainer Prosi

Rainer.Prosi@Heidelberg.com

Thank you very much for your attention!