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Proposal of RSS Extension for Security Information Exchange

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Opening

We propose JVNRSS (JP Vendor Status Notes RSS) as a security information sharing and exchanging specification. JVNRSS is based on RSS 1.0 and uses the “<dc:relation>" field defined in the Dublin Core as a Relational ID to correlate security information issued by various sources. JVNRSS uses the reference URL specified in a security alert, for example, an URL of the Common Vulnerability Exposure, CERT Advisory, CERT Vulnerability Note and CIAC Bulletin.

In this presentation, firstly we’ll explain the specification and applications of JVNRSS. Secondly, we'll introduce the result of our feasibility study on JVNRSS and lastly we'll propose the RSS Extension for security information sharing.

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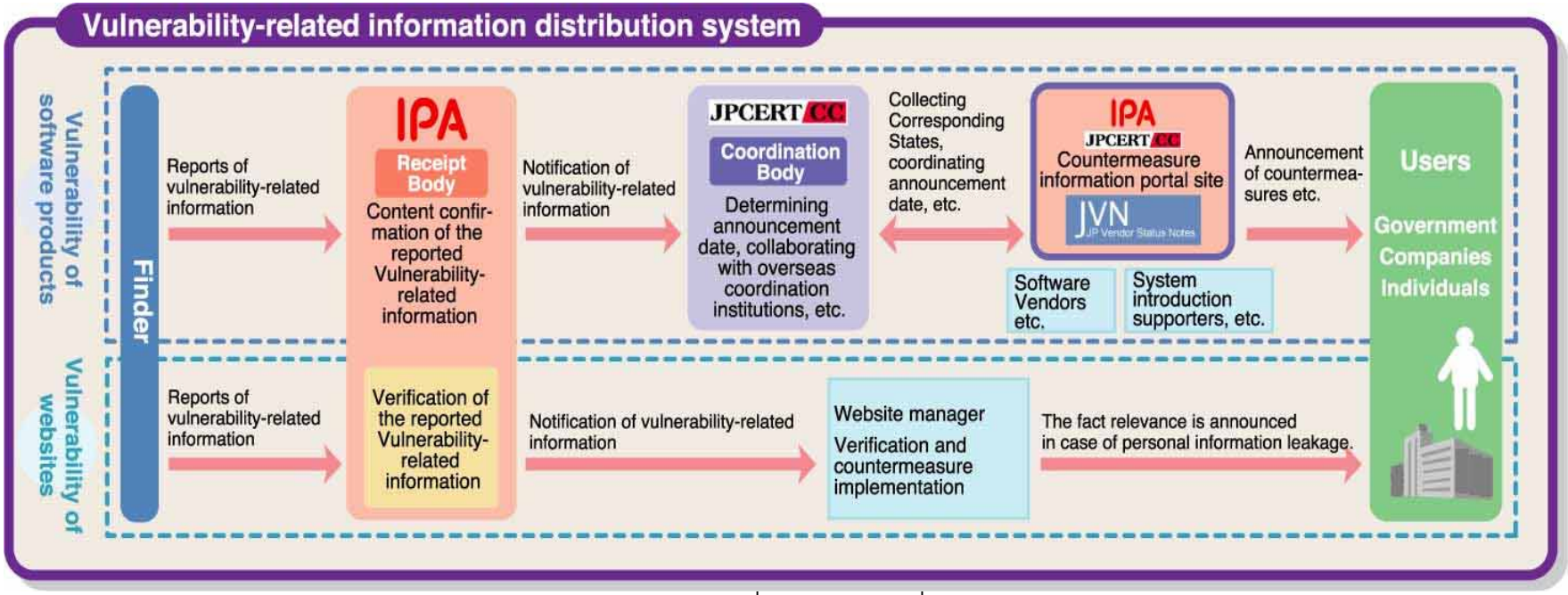
Vulnerability Information Handling Framework in Japan

1. Vulnerability Information Handling Framework in Japan

Under “the Guideline for Handling Vulnerability-related Information” Announced on July 7, 2004, into Effect on July 8, 2004

Government-private sector cooperation to promote a smooth information flow concerning vulnerabilities and countermeasures of software products/web site applications. The first vulnerability information handling mechanism that is based on the official rules.



Expected Effects

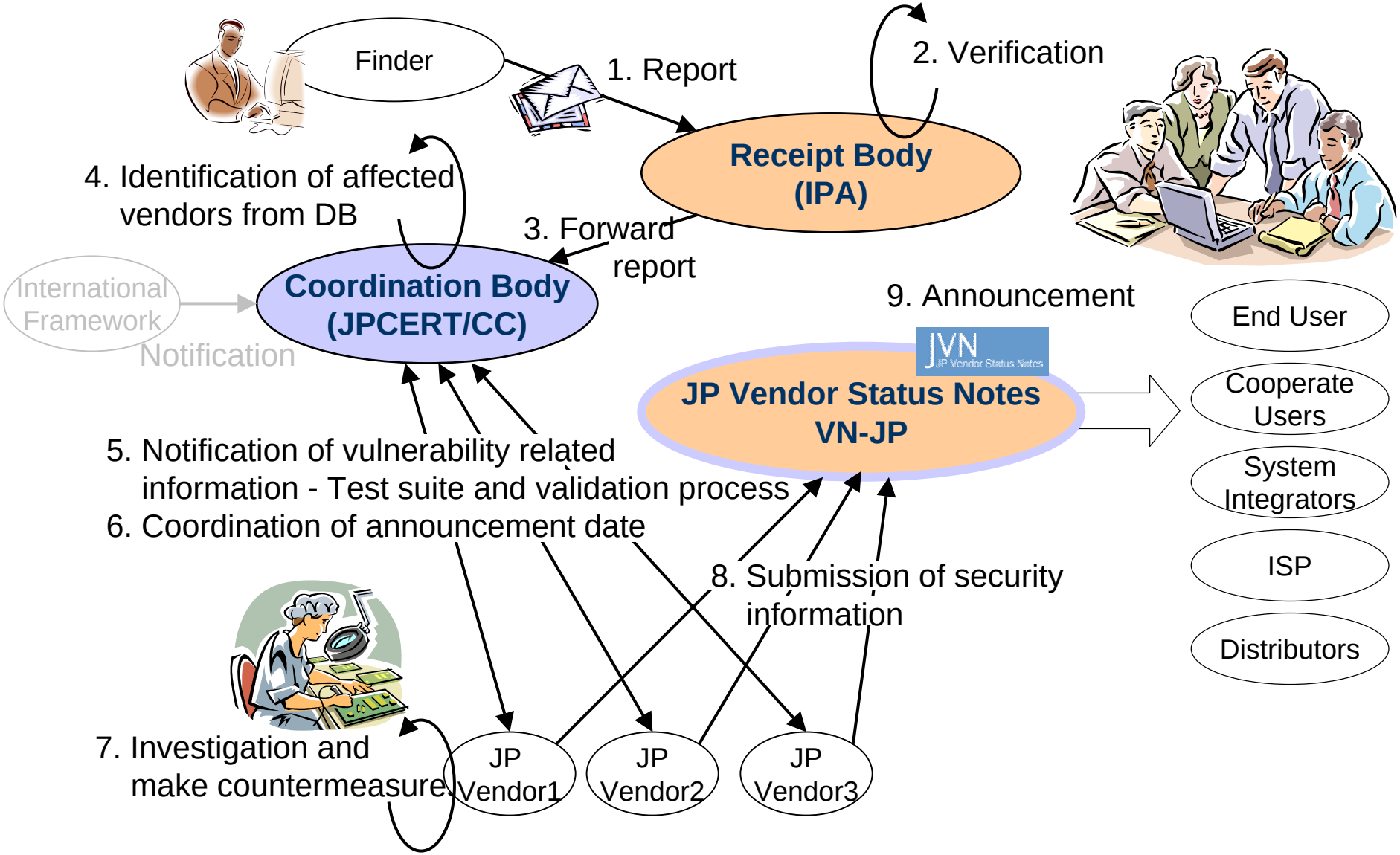
1. Promote proactive vulnerability response by vendors/web site operators
2. Curb neglect and improper publication of vulnerability information
3. Prevent leak of sensitive information and disruption of critical systems

1. Handling Framework for Vulnerability of Software product

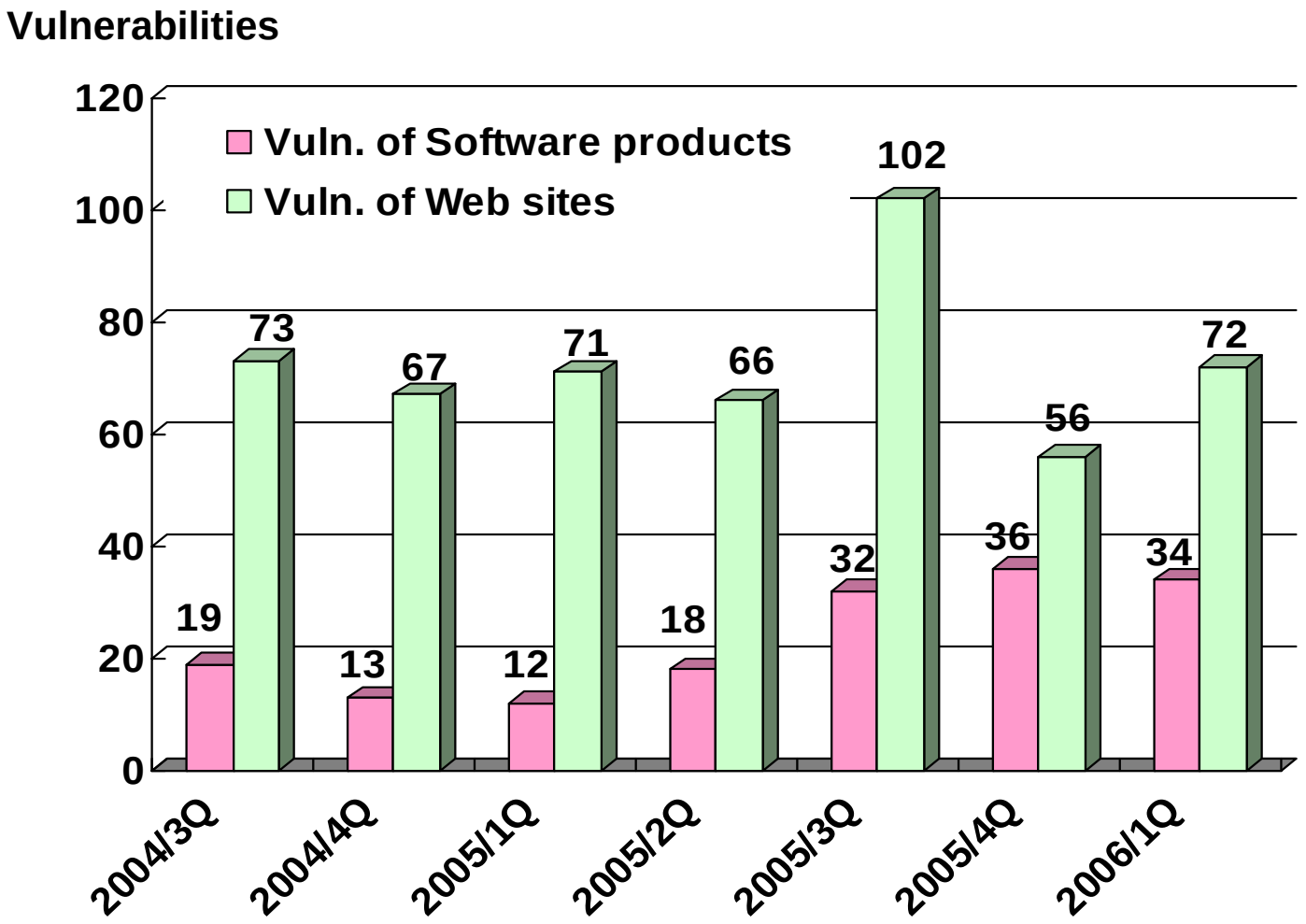
- The Software Vulnerabilities Handling Framework defines the operational process for vulnerability information handling from a vulnerability's discovery to its release to the public.
  - Report a vulnerability to IPA
  - Coordinate the vulnerability information handling between JPCERT/CC and JP product vendors
  - Investigate and eliminate vulnerabilities in the products of each JP vendor
  - Announce security information on JVN

- JPCERT/CC collaborates with CERT/CC and NISCC on vulnerability information handling in the International framework.

1. Handling Framework for Vulnerability of Software product



1. Vulnerabilities reported Statistics 2004-2006



http://www.ipa.go.jp/security/index-e.html

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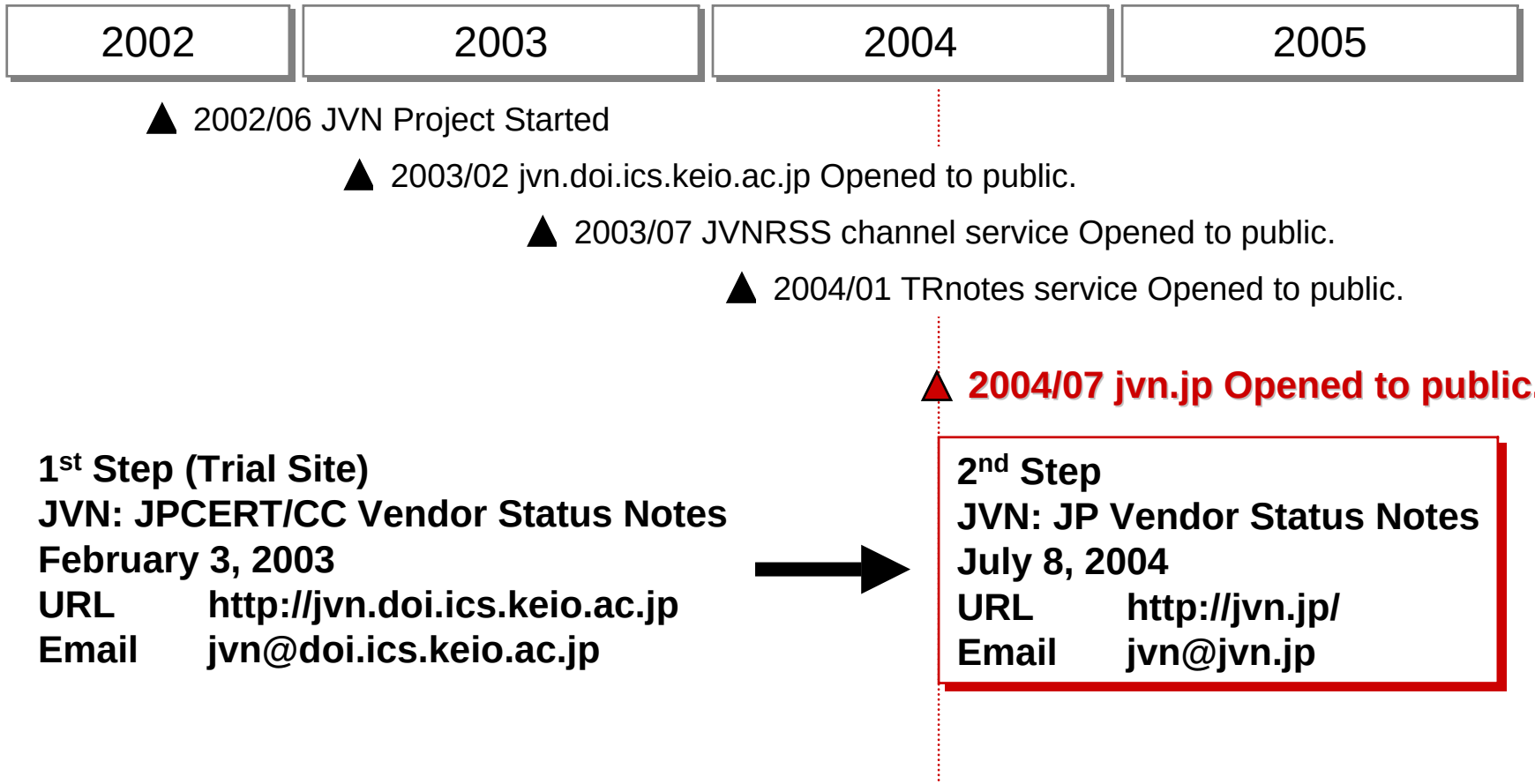
JVN: JP Vendor Status Notes

2. JVN History

- JVN project started in 2003 to make a portal site of security information of domestic product vendors in Japan.

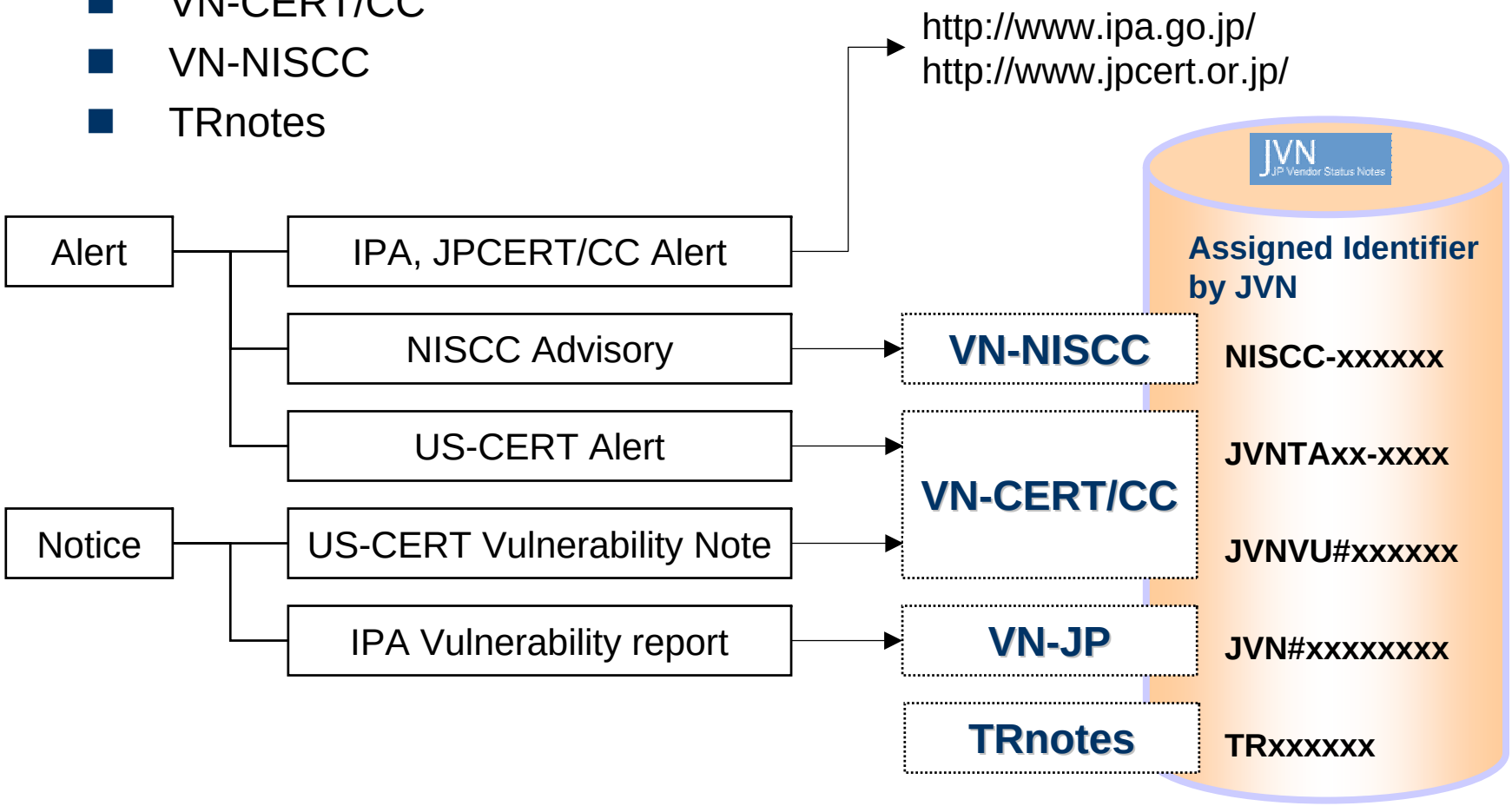


2. Overview of JVN

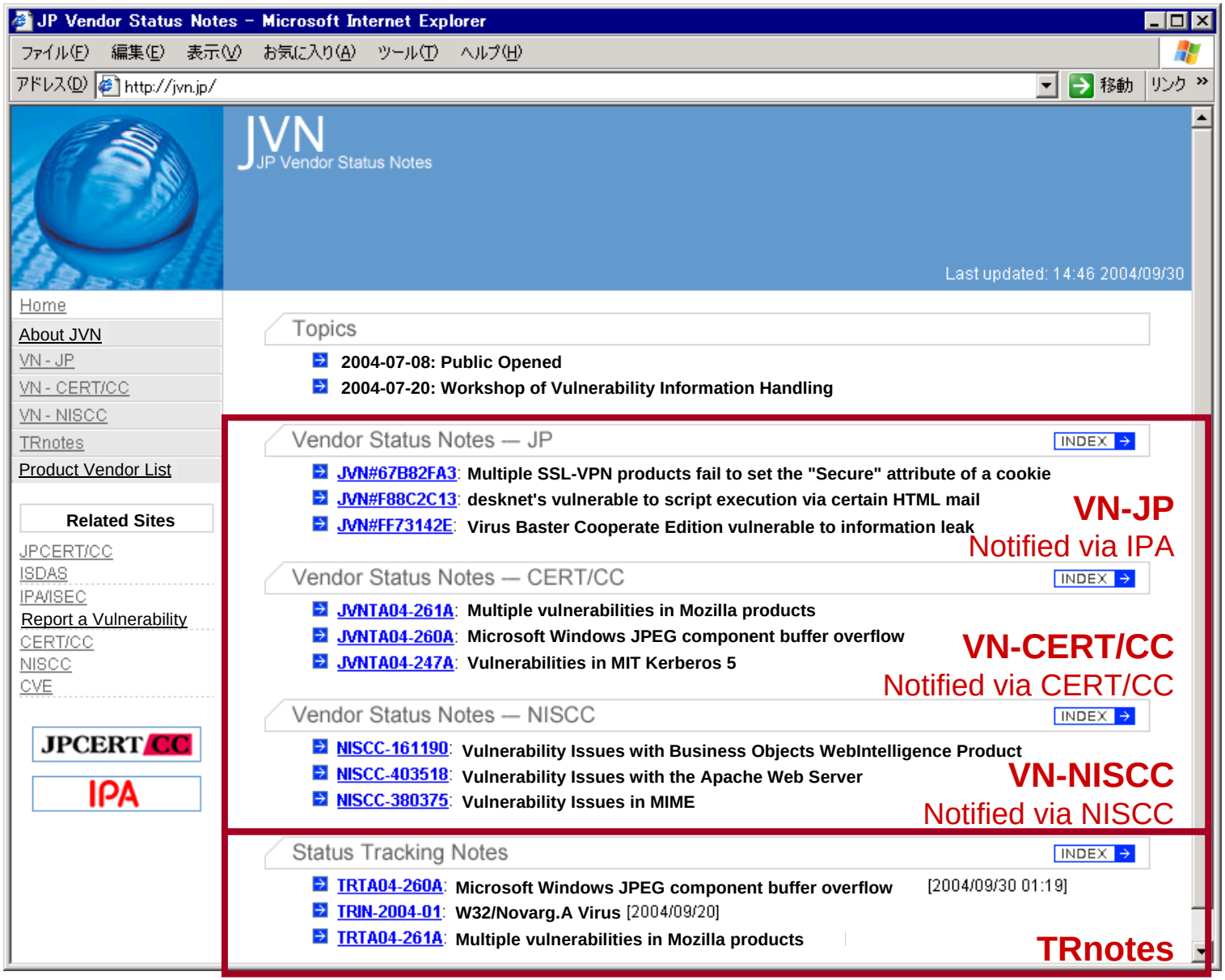
- July 2004, “JP Vendor Status Notes (JVN)” was launched as a portal site to offer security information on domestic product vendors under the vulnerability information handling framework in Japan.
  - Provide the Vendor Status Notes (VN) and the status Tracking Notes (TRnotes).
  - **“Vendor Status Notes (VN)”** VN is a service providing information on how to fix vulnerabilities. It is similar to the “CERT Vulnerability Notes” and follows up the IPA/JPCERT Vulnerability reports, US-CERT Alerts, US-CERT Vulnerability Notes and NISCC Advisories.
  - **“Status Tracking Notes (TRnotes)”** is a service providing information on the incidents, specifically what worms do, when the exploit codes were released and what the countermeasures are.

2. Information Categories at JVN

- “JP Vendor Status Notes (JVN)” has four information categories.
  - VN-JP
  - VN-CERT/CC
  - VN-NISCC
  - TRnotes

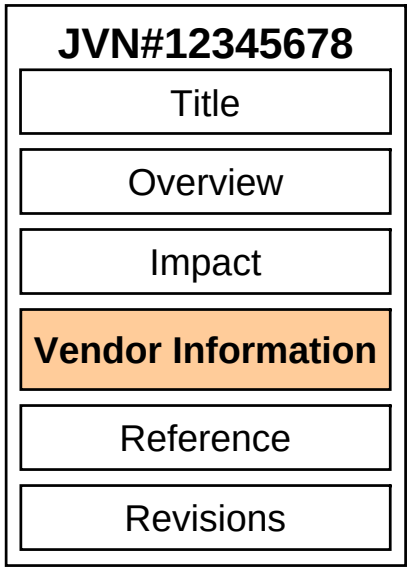


2. JVN Top page (http://jvn.jp/)



2. Vendor Status Notes (VN)

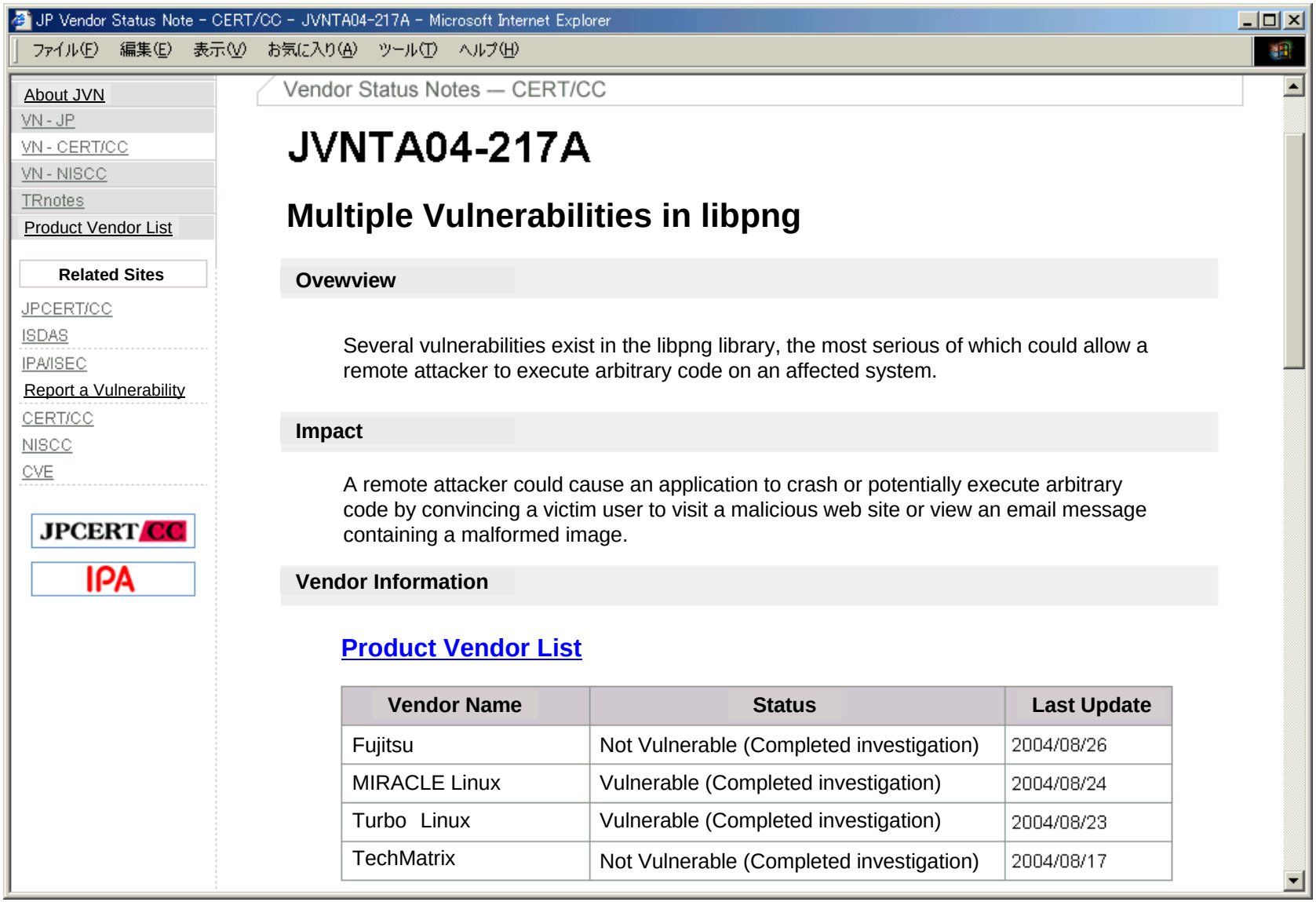
- “Vendor Status Notes (VN)” includes a list of JP product vendors who may have been affected by the reported vulnerabilities.
  - VN has three information categories such as VN-JP, VN-CERT/CC and VN-NISCC.
  - Each web page consists of the overview of the problem, its impact, vendor information and related information.



Vendor Information includes Vendor Name, Status and Last Update. There are five categories as Status.

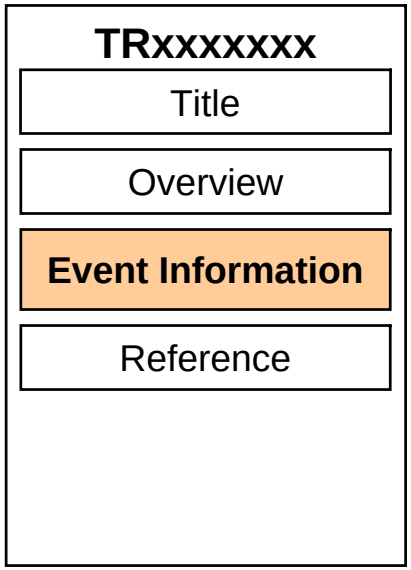
- Status
  - Unknown
  - Vulnerable
    - Vulnerable (Completed investigation)
    - Vulnerable (Under investigation)
  - Not Vulnerable
    - Not Vulnerable (Completed investigation)
    - Not Vulnerable (Under investigation)

2. Example of Vendor Status Notes (VN)



2. Vendor Status Notes (TRnotes)

- “Status Tracking Notes (TRnotes)” includes a list of event/time information on incidents concerning vulnerabilities.
  - Each web page consists of the overview, timeline concerning a vulnerability and related information.
  - The purpose of TRnotes is in sharing the timeline of the incident, which includes worm activities, the date exploit codes were released and the countermeasure against security incidents. The information is based on public information.

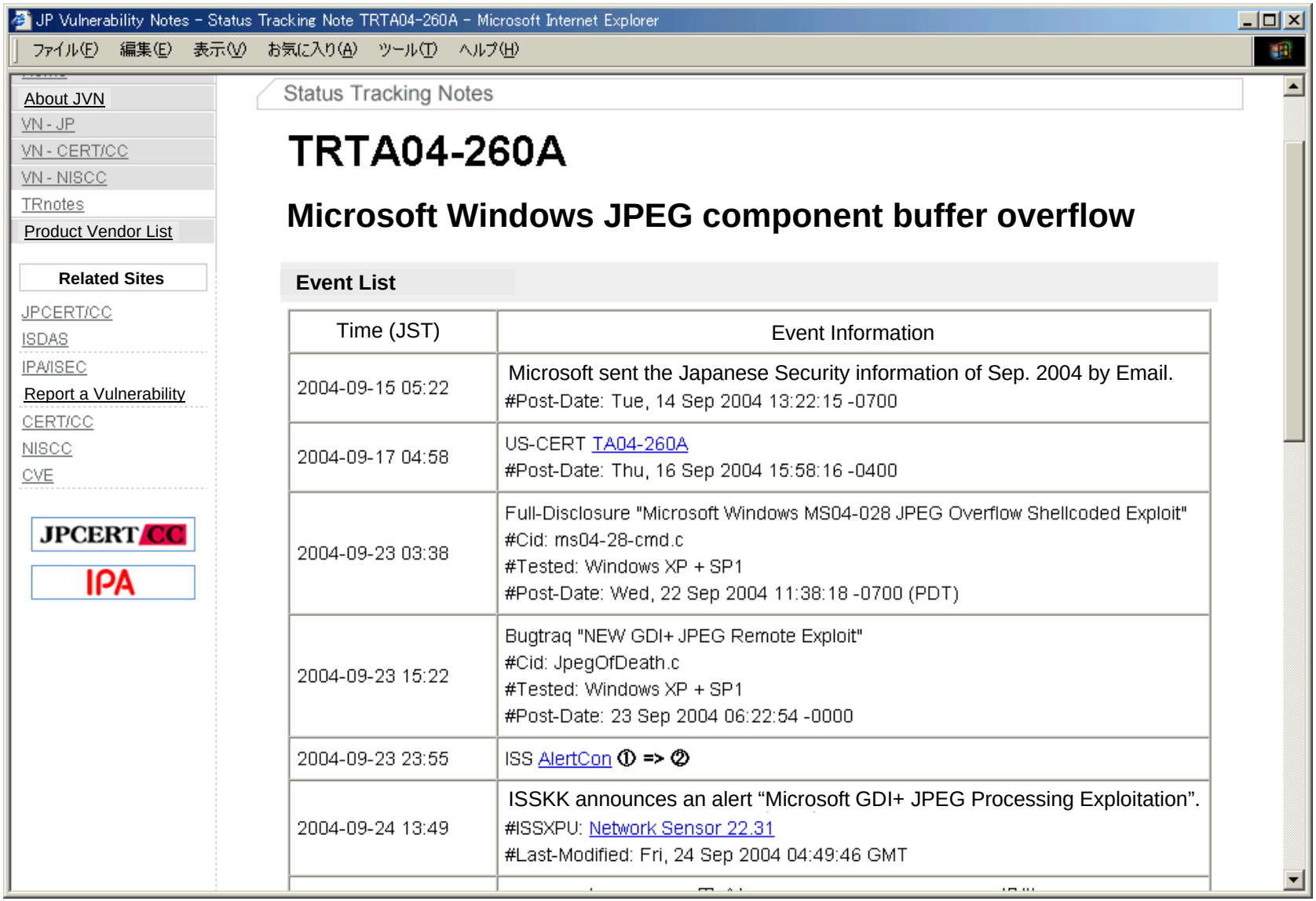


Event Information includes followings.

- Date the vulnerability was discvered
- Date any advisories are released
- Date exploit codes are published
- Date worms are produced
- Published alerts from governments.
- Additional resources, such as a government agency

etc.

2. Example of Vendor Status Notes (TRnotes)



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Proposal of RSS Extension for Security Information Exchange

3. Research motivation

- How we can provide a more efficient security information distribution service for the security administrators that helps them reduce their workload related to collecting and grouping various information and take care of security incidents.

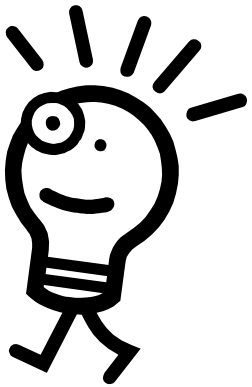
3. JVNRSS (JP Vendor Status Notes RSS)

- Keywords for the solution
  - Semantic Web
  - RSS (RDF Site Summary)

Format for the overview ***JVNRSS***

- **Title**
- **Overview**
- **Affected System**
- **Impact**
- **Solution**
- **Exploit**
- **Reference**

Format for the details ***VULDEF and others***



Using JVNRSS, an XML format to describe the overview, is an essential point in the security information exchange.

3. JVNRSS Specification

- JVNRSS
  - Summary format for security information exchange.
  - Based on RSS 1.0 and use the field <dc:relation> of Dubline Core as index of grouping security information.

```
<item rdf:about="URL of security information">
 <title>Title</title>
 <link>URL of security information</link>
 <dscription>Outline of security information</description>
  <dc:publisher>Product vendor name</dc:publisher>
  <dc:creator>Contact point information</dc:creator>
  <dc:identifier>Security information ID</dc:identifier>
  <dc:relation>Relational ID (1) {CVE|CERT-CA|CERT-VU|etc.}</dc:relation>
  <dc:relation>Relational ID (2) {CVE|CERT-CA|CERT-VU|etc.}</dc:relation>
  <dc:relation>      :      :                              </dc:relation>
  <dc:date>Date last updated</dc:date>
  <dcterms:issued>Date first published</cterms:issued>
  <dcterms:modified>Date last updated</dcterms:modified>
</item>
```

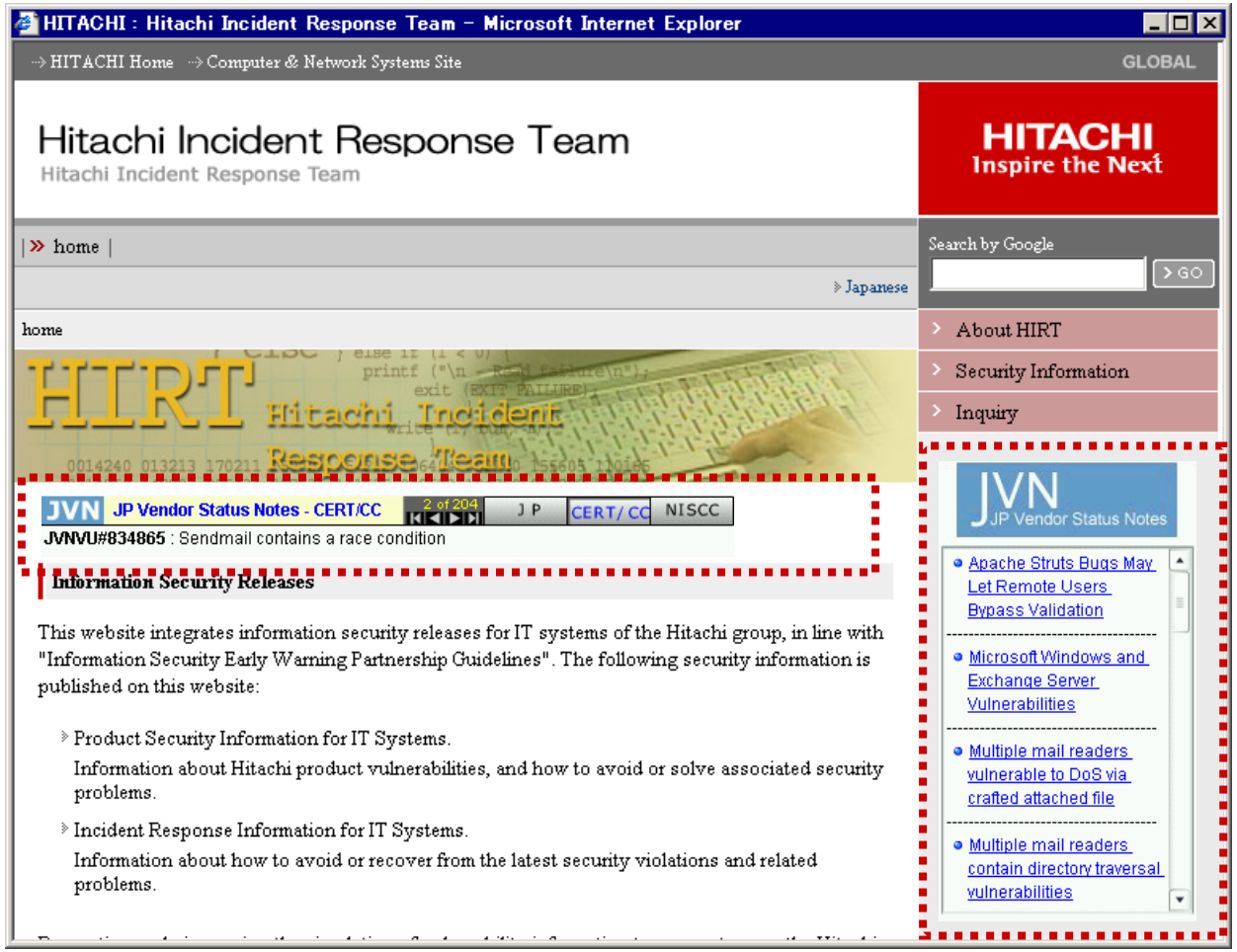
3. JVNRSS Example

- ***ID:*** JVNVU#834865
- ***Title:*** Sendmail contains a race condition
  - ***Reference:*** http://www.us-cert.gov/cas/techalerts/TA06-081A.html
  - ***Reference:*** http://www.kb.cert.org/vuls/id/834865
  - ***Reference:*** http://cve.mitre.org/cgi-bin/cvename.cgi?name=2006-0058

```
<item rdf:about="http://jvn.jp/cert/JVNVU%23834865">
 <title>Sendmail contains a race condition</title>
 <link>http://jvn.jp/cert/JVNVU%23834865</link>
 <description>A race condition in Sendmail may allow a remote attacker …    </description>
  <dc:publisher>JVNRSS-DEV project</dc:publisher>
  <dc:creator>jvn@jvn.jp</dc:creator>
  <dc:identifier>JVNVU#834865</dc:identifier>
  <dc:relation>http://www.us-cert.gov/cas/techalerts/TA06-081A.html</dc:relation>
  <dc:relation>http://www.kb.cert.org/vuls/id/834865</dc:relation>
  <dc:relation>http://cve.mitre.org/cgi-bin/cvename.cgi?name=2006-0058</dc:relation>
  <dc:date>2006-04-03T10:30+09:00</dc:date>
  <dcterms:issued>2006-03-23T04:00+09:00</dcterms:issued>
  <dcterms:modified>2006-04-03T10:30+09:00</dcterms:modified>
</item>
```

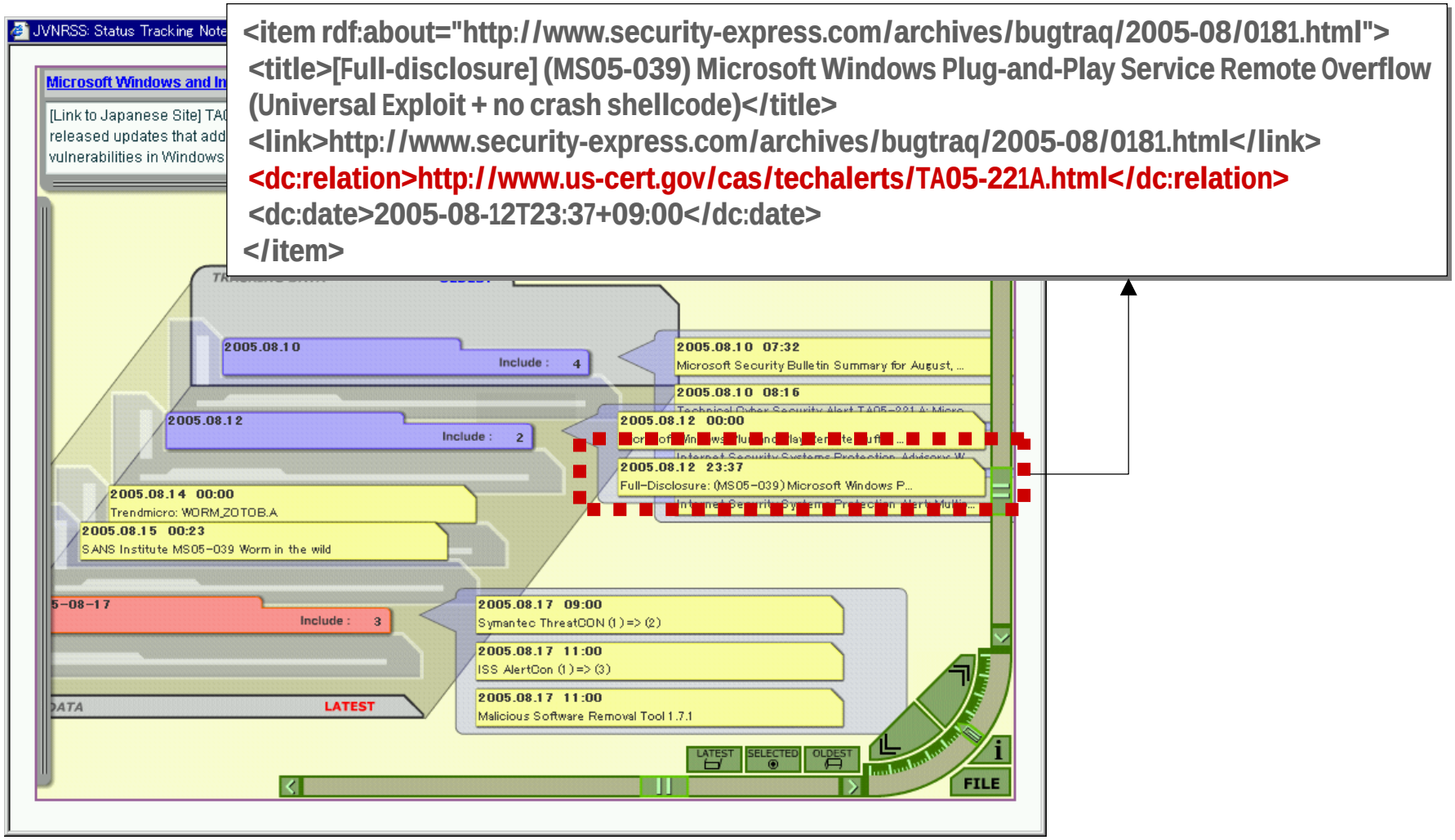
3. JVNRSS Application: Visualized JVNRSS

- **Offer the summary of JVN articles through other websites.**



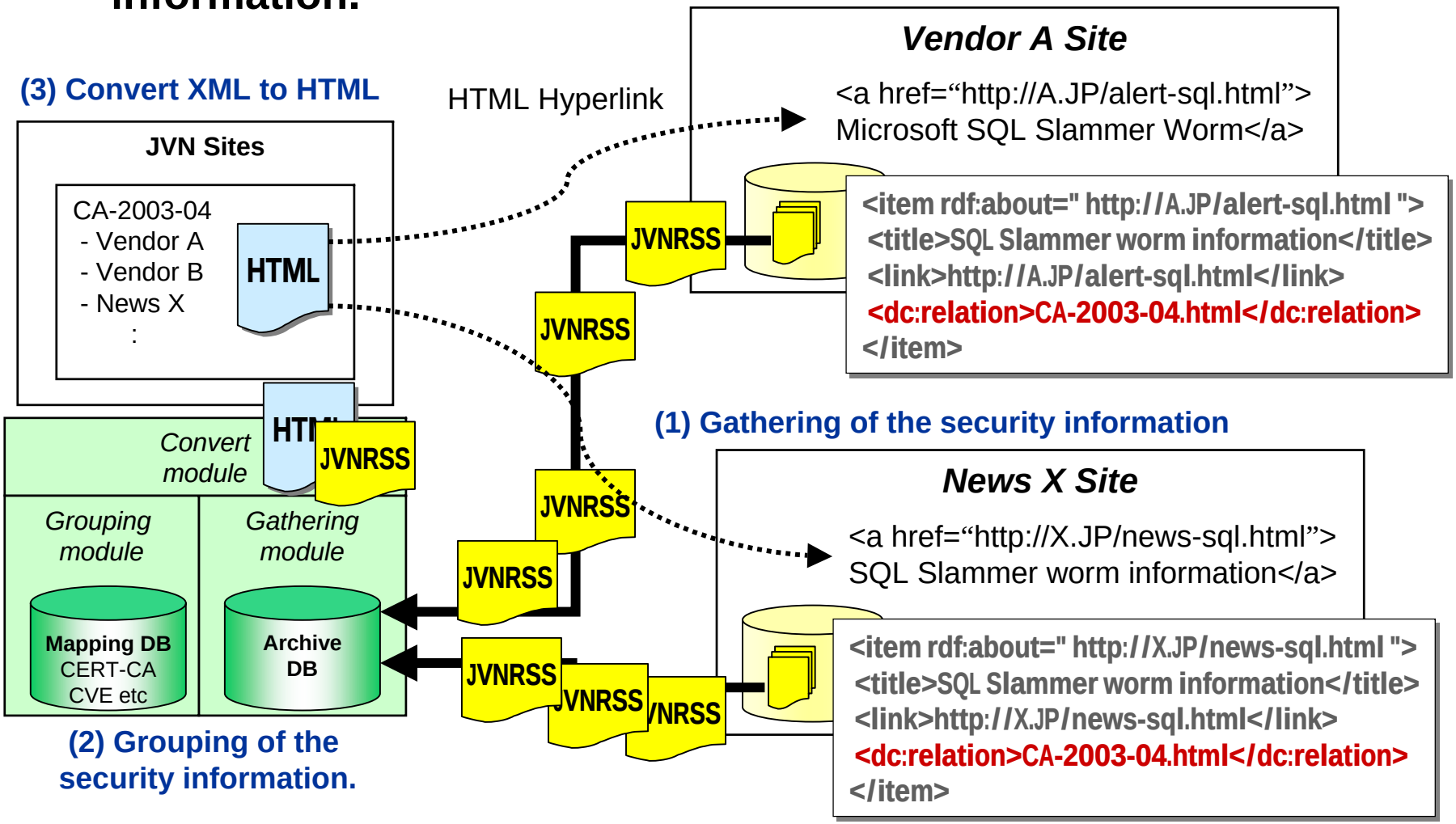
3. JVNRSS Application: Visualized TRnotes

- **Arrange all events by time.**



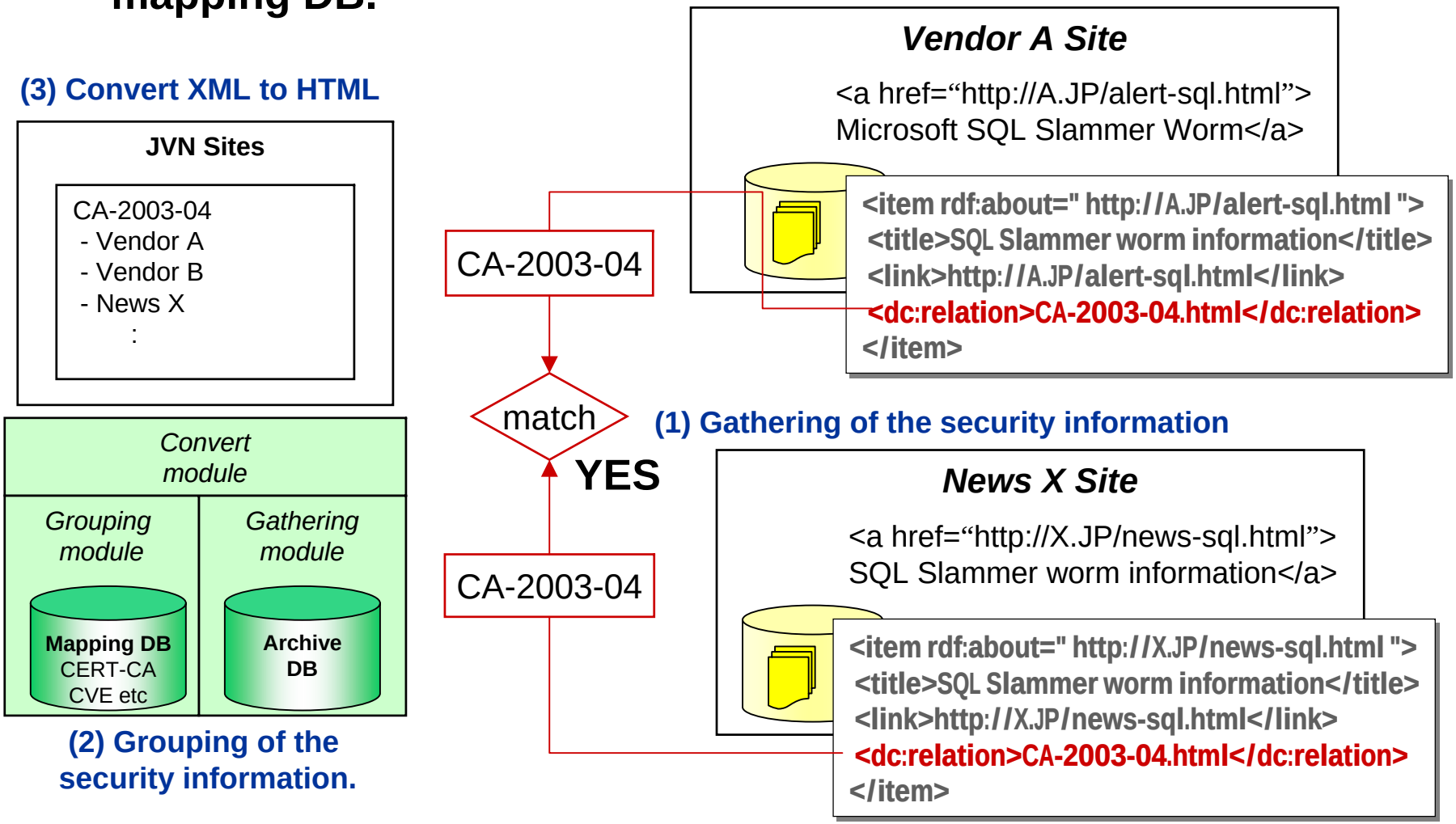
3. JVNRSS Application: Security information gathering system

- **Reduce workload in collecting and grouping security information.**



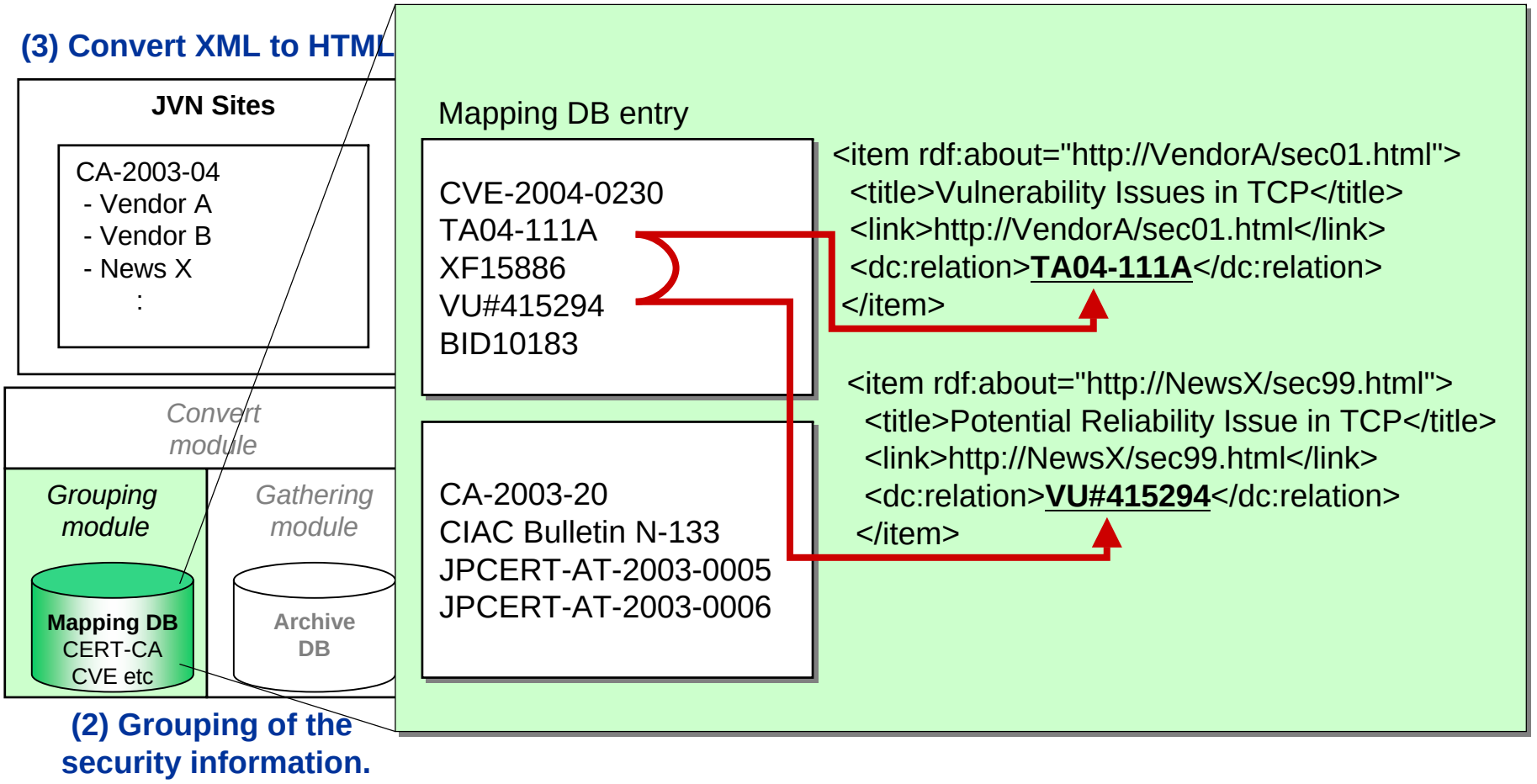
3. JVNRSS Application: Proposal grouping (correlation) mechanism

- **The grouping mechanism using Relational ID without mapping DB.**



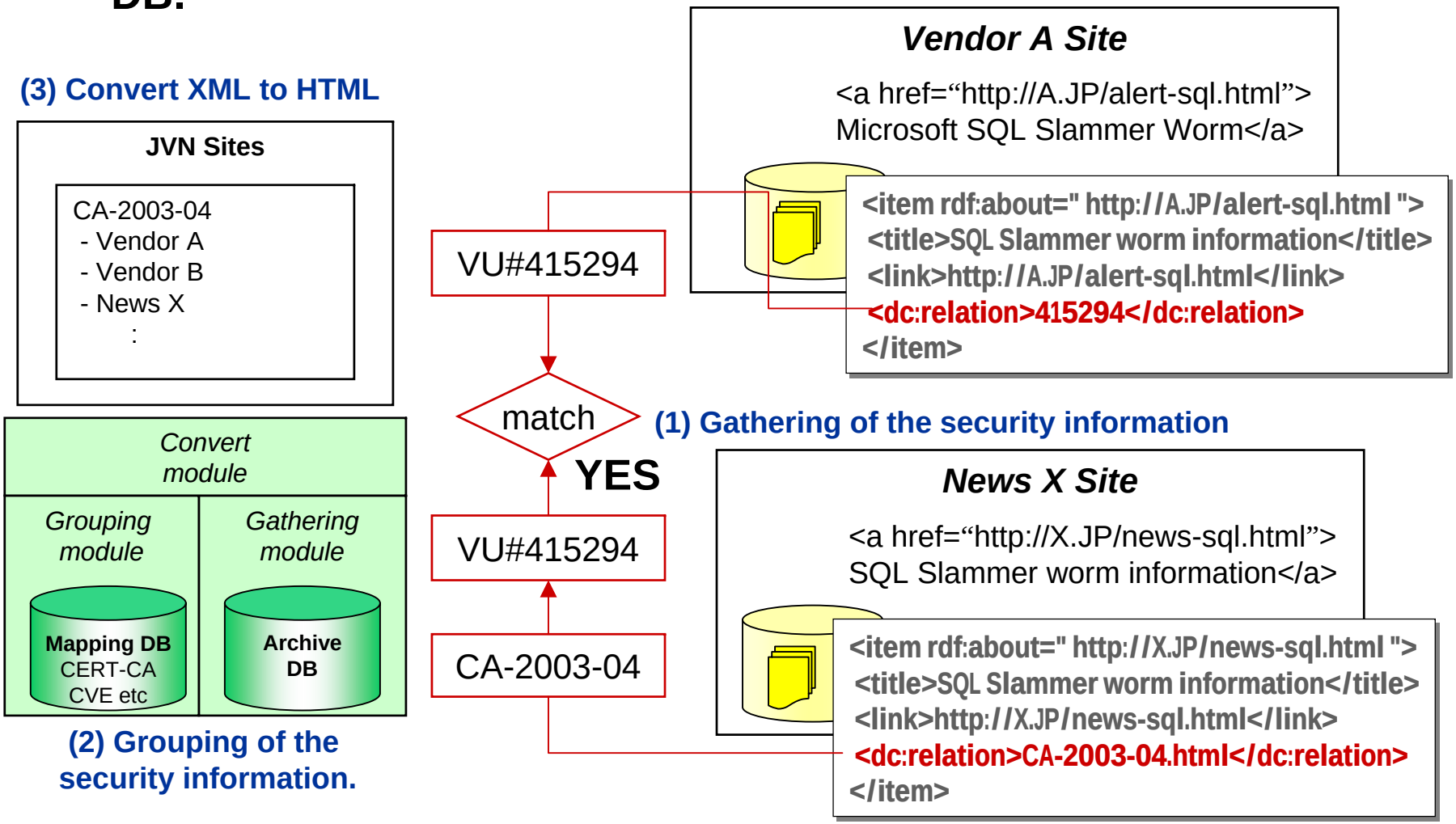
3. JVNRSS Application: Proposal grouping (correlation) mechanism

- **The grouping mechanism using Relational ID with mapping DB.**



3. JVNRSS: Proposal grouping (correlation) mechanism

- **The grouping mechanism using Relational ID with mapping DB.**



3. JVNRSS practical activity

- **CVE+** http://jvnrss.ise.chuo-u.ac.jp/jtg/cve+/

  CVE+ is to make a relationship map between CVE and Japanese security information.

- **TRnotes** http://jvnrss.ise.chuo-u.ac.jp/jtg/trn/

  TRnotes provides HTML based information, JVNRSS format and Visualized TRnotes.

- **XSL_swf** http://jvnrss.ise.chuo-u.ac.jp/jtg/xswf/

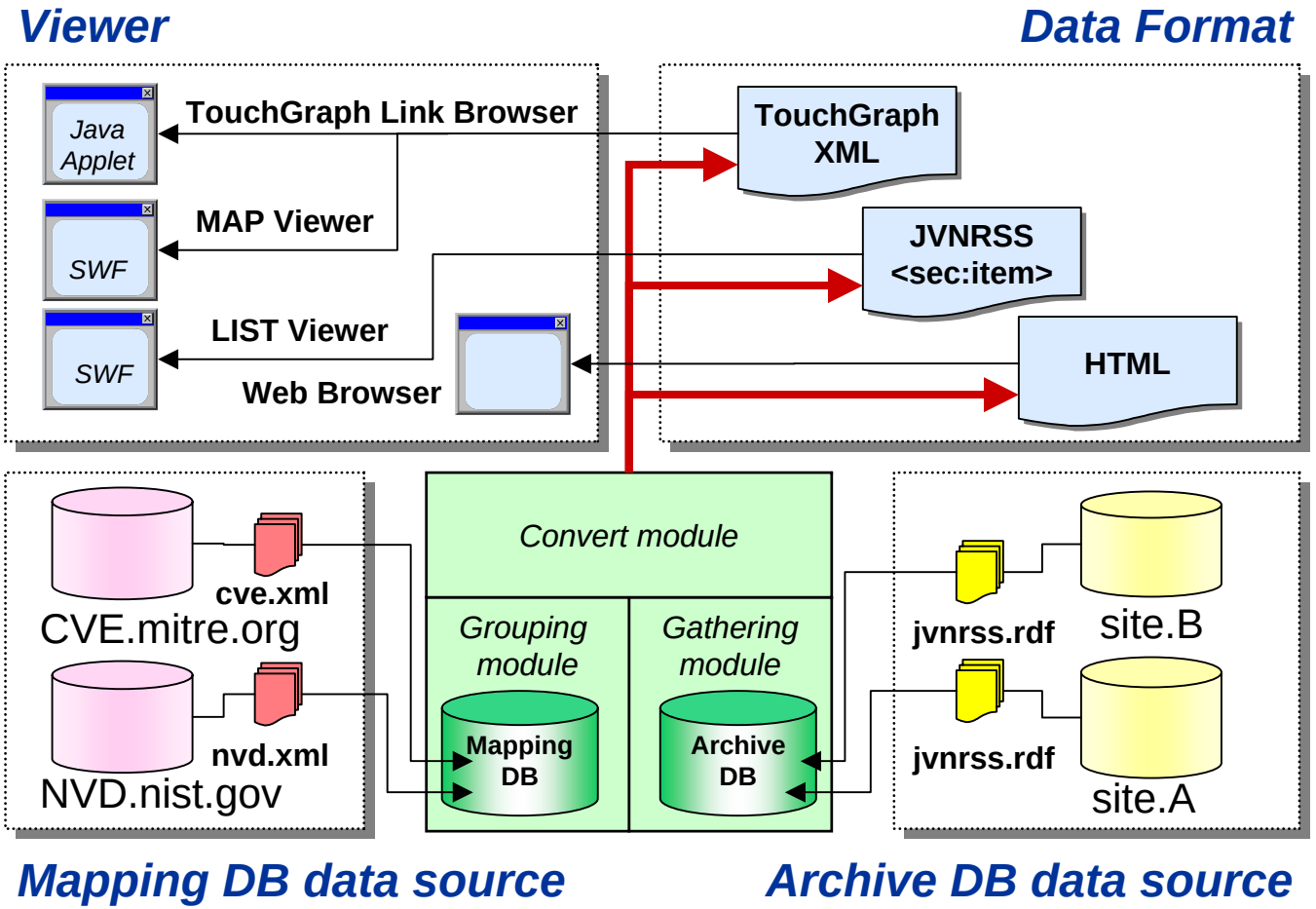
  XSL_swf is FLASH tool for visualized JVNRSS and uses a part of XSL as a mechanism to describe how the document should be displayed.

- **RSS_dir** http://jvnrss.ise.chuo-u.ac.jp/jtg/rssd/

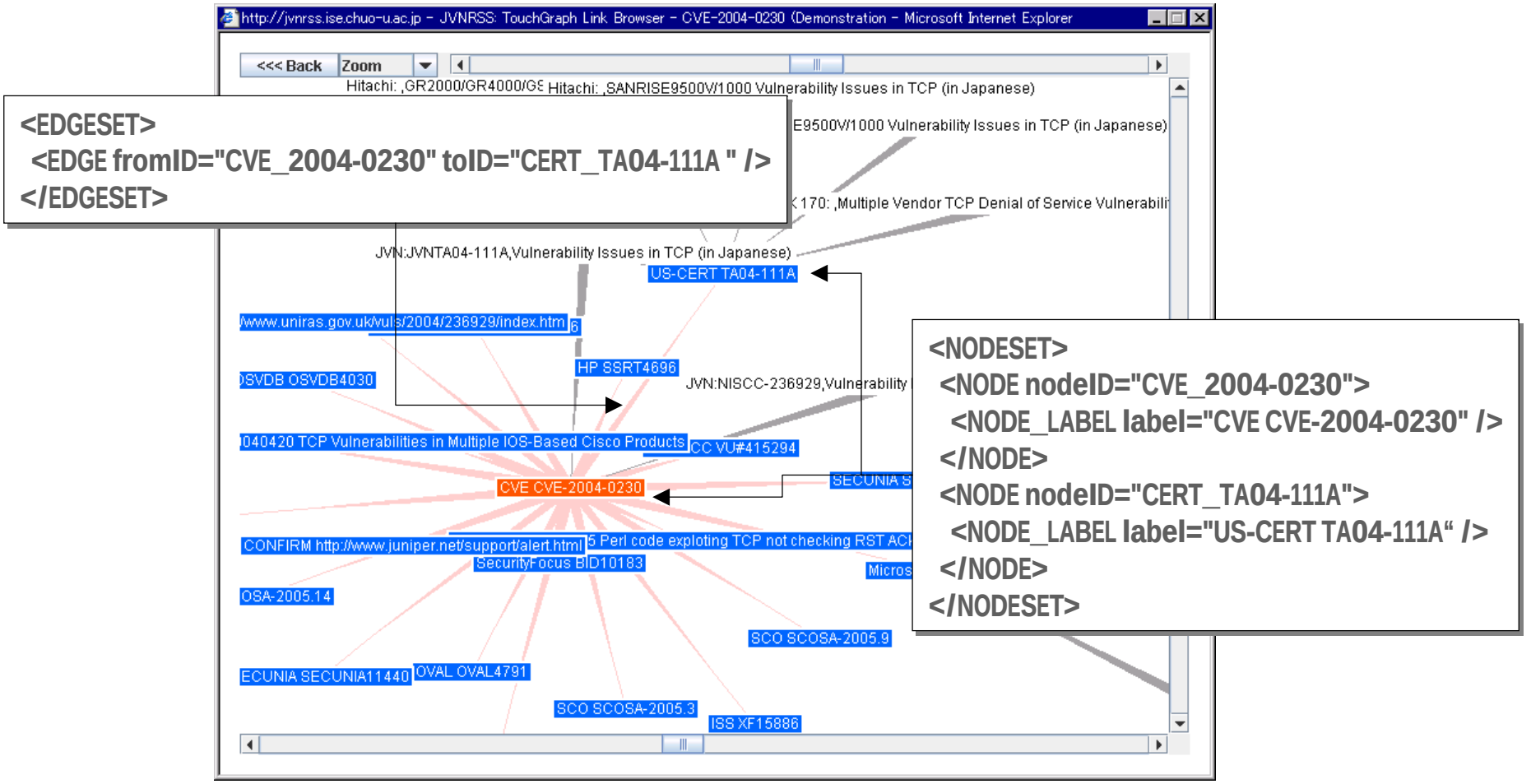
  RSS_dir is concept of RSS directory for RSS channel. RSS directory describes a RSS channel tree with RSS format.

- **SIG_rdf** http://jvnrss.ise.chuo-u.ac.jp/jtg/xsig/

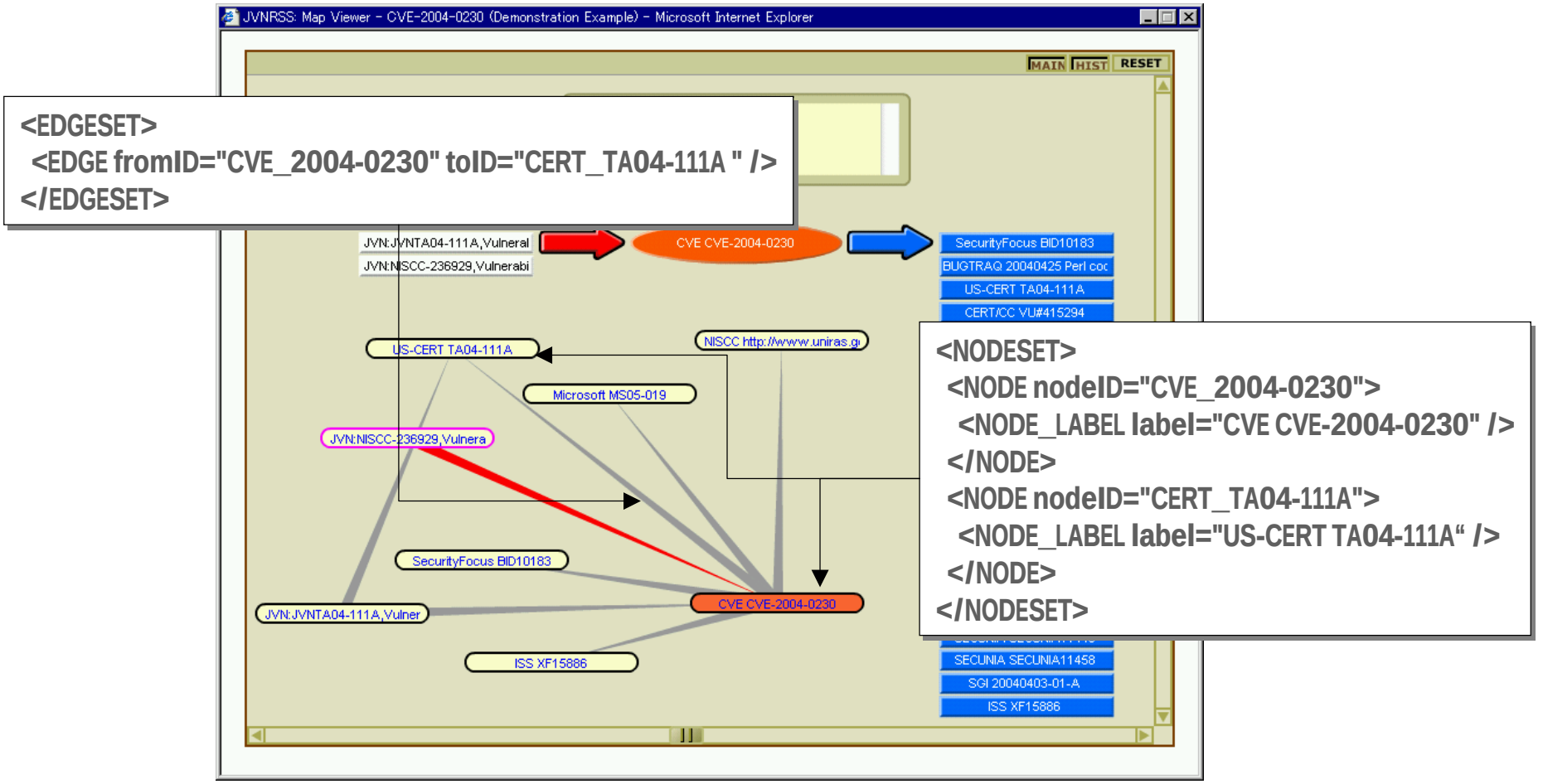
- Prototype system
  - ***Modules:*** gathering, grouping and convert



- ***Viewer:*** TouchGraph Link Browser (Java Applet)
  - ***Data Format:*** TouchGraph XML format



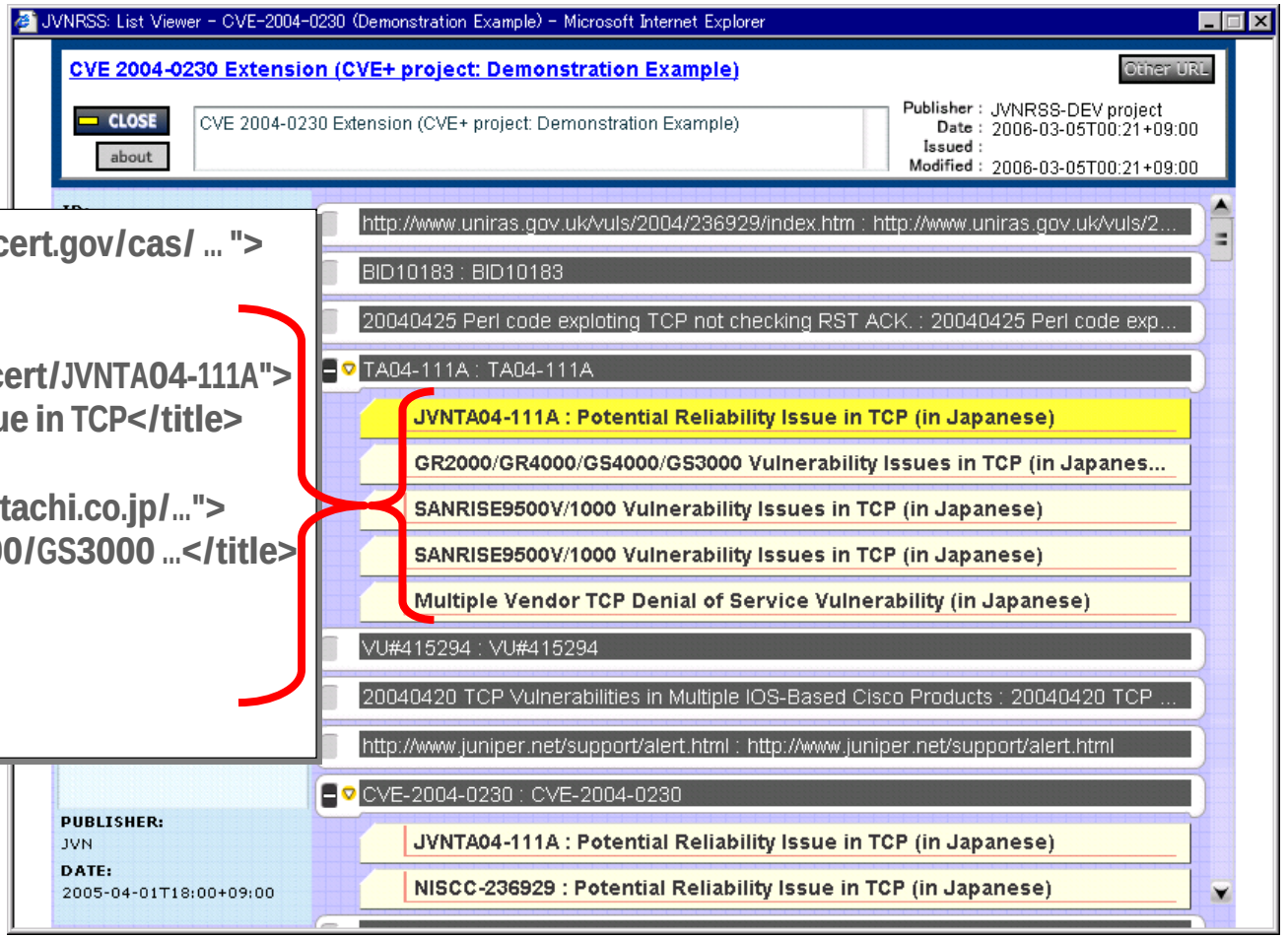
- ***Viewer:*** Map Viewer (SWF)
  - ***Data Format:*** TouchGraph XML format



- ***Viewer:*** LIST Viewer (SWF)
  - ***Data Format:*** JVNRSS + <sec:item> format

```
<item rdf:about="http://www.us-cert.gov/cas/ ... ">
 <title>TA04-111A</title>
 <sec:item>
  <item rdf:about="http://jvn.jp/cert/JVNTA04-111A">
   <title>Potential Reliability Issue in TCP</title>
  </item>
  <item rdf:about="http://www.hitachi.co.jp/...">
   <title>GR2000/GR4000/GS4000/GS3000 ...</title>
  </item>

 </sec:item>
</item>
```



XSL_swf

- XSL_swf is a FLASH tool for the visualized JVNRSS
  - XSL_swf refers to an XSL file to describe how a document should be displayed.

JVNRSS or RSS

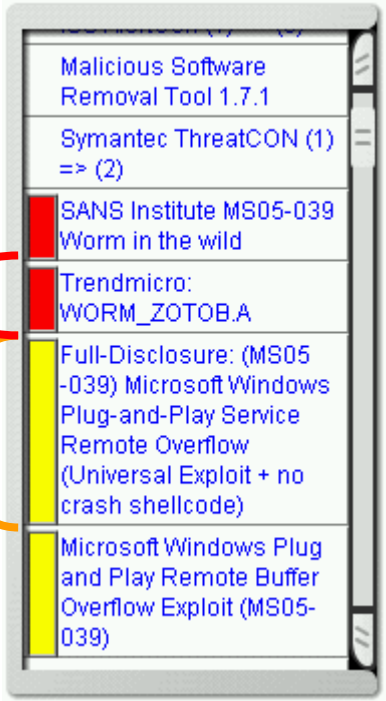
```
<?xml-stylesheet href="./trn.xsl" type="text/xsl" ?>

<item rdf:about="http://www.trendmicro.co.jp/ ... WORM_ZOTOB.A">
 <title>Trendmicro: WORM_ZOTOB.A</title>
 <link>http://www.trendmicro.co.jp/ ... WORM_ZOTOB.A</link>
</item>
<item rdf:about="http://www.security-express.com/ ... 0181.html">
 <title>[Full-disclosure] (MS05-039) Microsoft Windows Plug-and-Play ... </title>
 <link>http://www.security-express.com/ ... 0181.html</link>
</item>
```

XSL

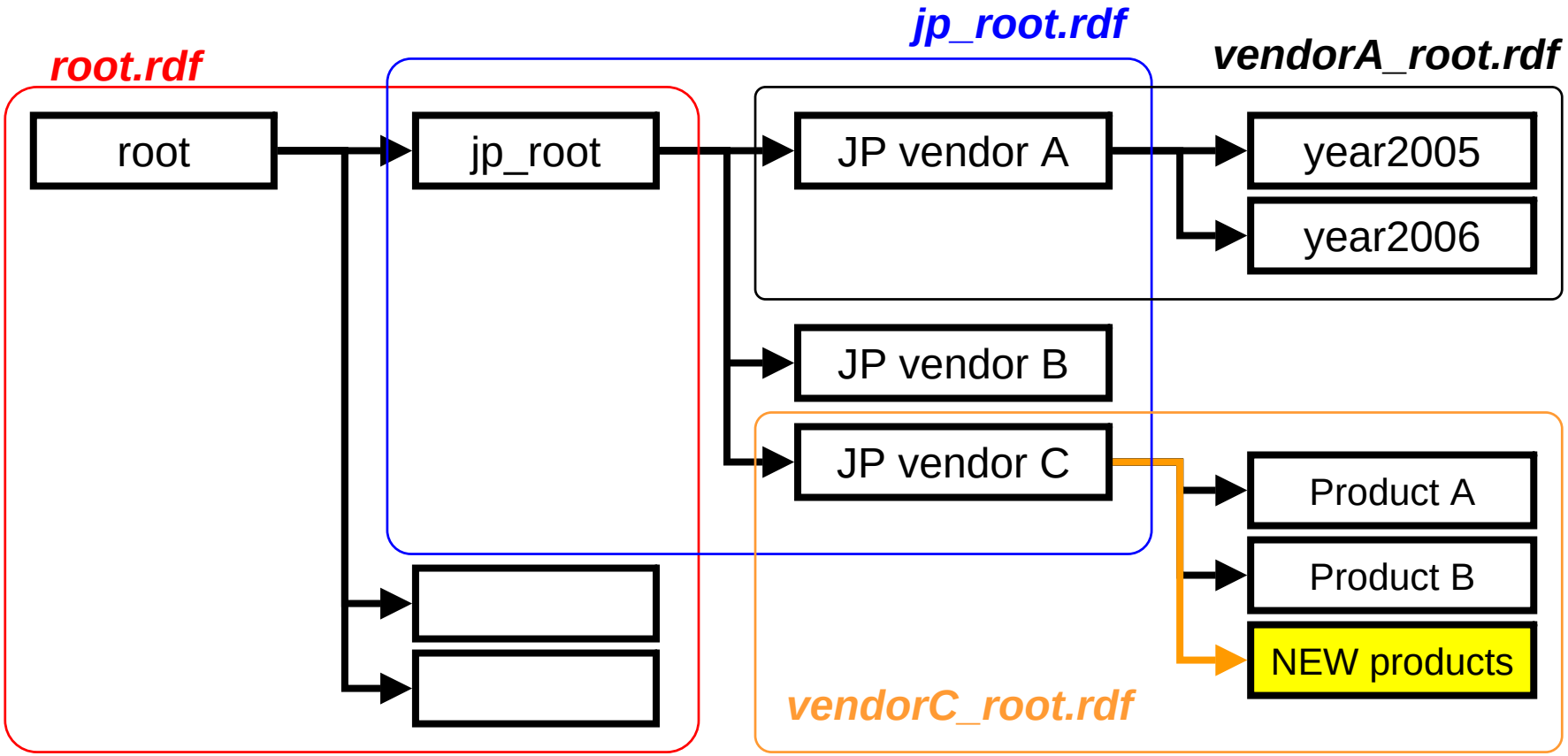
```
<xsl:stylesheet version="1.0"

<xsl:when test="rss:link=“'http://www.trendmicro.co.jp/ ... WORM_ZOTOB.A'">
LEVEL1</xsl:when>
<xsl:when test="rss:link='http://www.security-express.com/ ... 0181.html'">
LEVEL2</xsl:when>
```

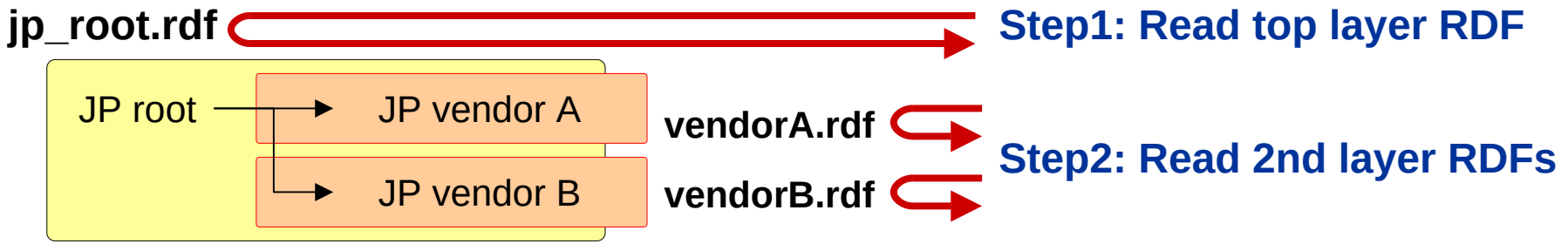


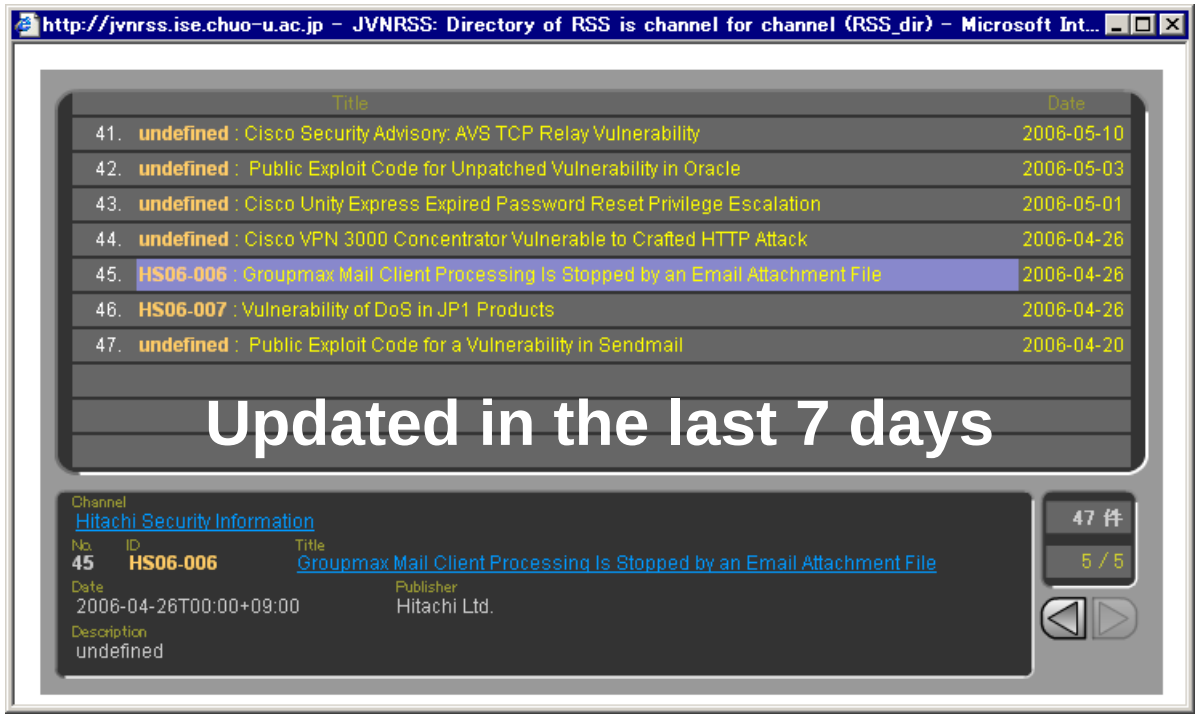
RSS_dir

- RSS_dir is a concept of the RSS directory for the RSS channel. RSS directory describes a RSS channel tree using the RSS format.
  - Check the feed for changes and react to the changes in an appropriate way



- Use RSS_dir to selectively display the information collected/updated in the last 7 days





3. Proposal RSS Extension

- JVNRSS is based RSS 1.0 and a proprietary format in Japan.
- Exchange security information in worldwide.
- The ability to use RSS holds the key to successfully implement a scheme for distributing security related information.
  - Qualified Security Advisory Reference (mod_sec)

    RSS Extension definition of the tags for RSS 1.0, RSS 2.0 and Atom

3. MOD_SEC: sec:references

- sec:references is an element for a best reference (CVE, CERT Advisory, CERT Vulnerability Note, US-CERT Technical Alert etc.) to related security information.
- Syntax

  <sec:references sec:source="%name" sec:id="%id">

  %ResourceReference</sec:references>

  - **%name**

    An attribute is abbreviation name, which provides the best reference, such as CVE, JPCERT, CERT, CIAC, BID, CERT-VN, MS, OSVDB, XF etc.
  - **%id**

    An attribute is the unique identifier assigned by sec:source, such as VU#105259, MS01-044, CVE-2001-0525, CA-2001-14, TA05-111A etc.
  - **%ResourceReference**

    An entity value is a URI reference to a resource.

3. MOD_SEC: sec:identifier

- sec:identifier is an element for the unique identifier assigned by vendor.
- Syntax

  </sec:identifier>%id</sec:identifier>

  - **%id**

    An attribute is the unique identifier assigned by vendor, such as "Cisco Security Advisory ID#50960", HPSBMA01234 etc.

3. MOD_SEC: Example
Atom + <sec:identifier> and <sec:references>

- ***ID:*** JVNTA06-109A
- ***Title:*** Oracle Products Contain Multiple Vulnerabilities
  - ***Reference:*** http://www.us-cert.gov/cas/techalerts/TA06-109A.html

```
<entry>
 <title>Oracle Products Contain Multiple Vulnerabilities</title>
 <link rel="alternate" type="text/html" href="http://jvn.jp/cert/JVNTA06-109A/"/>
 <id>http://jvn.jp/cert/JVNTA06-109A/</id>
 <summary type="text">Oracle products and components are affected by multiple
 vulnerabilities. </summary>
 <published>2006-04-20T11:30+09:00</published>
 <updated>2006-04-21T15:00+09:00</updated>
 <author>
  <name>JVN</name>
  <email>jvn@jvn.jp</email>
  <uri>http://jvn.jp/</uri>
 </author>
 <sec:identifier>JVNTA06-109A</sec:identifier>
 <sec:references sec:source="CERT" sec:id="TA06-109A">
        http://www.us-cert.gov/cas/techalerts/TA06-109A.html</sec:references>
</entry>
```

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Reference

- **IPA (Information-technology Promotion Agency, Japan)**
  - http://www.ipa.go.jp/english/about/index.html
  - http://www.ipa.go.jp/english/security/index.html
- **JPCERT/CC**
  - http://www.jpcert.or.jp/english/
- **JVN (JP Vendor Status Notes)**
  - http://jvn.jp/ (Japanese)
  - http://www.ipa.go.jp/english/security/third.html
- **JVNRSS (JP Vendor Status Notes RSS) Feasibility Study Site**
  - http://jvnrss.ise.chuo-u.ac.jp/jtg/

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Ending

We propose "JVNRSS" to solve the problems and improve the security information exchange for security administrators. JVNRSS is based on RSS 1.0 and use the field <dc:relation> of Dubline Core as index of grouping security information. This presentation has discussed the specification of JVNRSS and the application, especially the gathering and grouping approach for the security information exchange. Furthermore, we introduce RSS extension of security information exchange.

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Thank you

Proposal of RSS Extension for Security Information Exchange

2006/06/30

Masato Terada
office@jpcert.or.jp
http://jvn.jp/

IPA (Information-technology Promotion Agency, Japan)
JPCERT/CC (Japan Computer Emergency Response Team Coordination Center)