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Performance Considerations for JD Edwards EnterpriseOne

THE INFORMATION COMPANY

EnterpriseOne Performance: Agenda

- **Top EnterpriseOne performance-related items of the past year, with emphasis on the web and EnterpriseOne 8.11 and above**
  - **NOT intended as detailed, platform specific tuning**
- **EnterpriseOne Web client**
  - EnterpriseOne HTML: Apache
  - EnterpriseOne HTML: JVM
  - EnterpriseOne HTML: JAS
  - EnterpriseOne HTML: Client PC
  - EnterpriseOne HTML: Misc items
- **EnterpriseOne Enterprise Server**

EnterpriseOne HTML: Apache

- **httpd.conf – Expiration headers**

```
# Windows prior to Apache 1.3.15:
LoadModule expires_module modules/ApacheModuleExpires.dll
# OR
# Unix, and Windows as of Apache 1.3.15:
LoadModule expires_module modules/mod_expires.so

ExpiresActive on
ExpiresByType image/gif "access plus 30 days"
ExpiresByType text/css "access plus 30 days"
ExpiresByType application/x-javascript "access plus 30 days"
```

- **EnterpriseOne version level requirements:** ALL
- ALL EnterpriseOne HTML implementations should apply these settings
- Caches small, frequently used static local objects: .gif, javascript, .css
- **Crucial for WAN implementations** – very large impact on bandwidth capacity
  - The major symptoms here are slowness in **expanding menu trees** and **loading forms**.
- Significant improvement achieved for many WAN multi-user implementations:
  - Across two European countries over a 2MB line
  - Australia to USA
  - Across continental USA

EnterpriseOne HTML: Apache

- **Web Accelerators**
  - Specialized network hardware caches all content locally so that no network WAN roundtrips are required for any content, even for initial fetches.
  - In most cases, this is not necessary to resolve the bandwidth related LAN performance issues; the expiration headers alone will achieve this. However, the hardware will alleviate bandwidth constraints even further.

  - RedLine Networks
    - www.RedlineNetworks.com
  - NetScaler
    - www.NetScaler.com

EnterpriseOne HTML: Apache

- **httpd.conf – HTTP Compression**

```
LoadModule deflate_module modules/mod_deflate.so

AddOutputFilterByType DEFLATE text/html text/plain text/xml
AddOutputFilterByType DEFLATE application/ms* application/postscript

DeflateCompressionLevel 5

SetEnvIfNoCase Request_URI \.(gif|jpe?g|png|js)$ no-gzip dont-vary
SetEnvIfNoCase Request_URI \.(exe|t?gz|zip|bz2|sit|rar)$ no-gzip dont-vary
SetEnvIfNoCase Request_URI \.(pdf|ube)$ no-gzip dont-vary
```

  - **EnterpriseOne version level requirements:** ALL
  - ALL EnterpriseOne HTML implementations should apply these settings
  - **Requires HTTP 2.0**
  - Crucial for WAN implementations
  - **Note**: the **DeflateCompressionLevel** entry can be set to a value from **0** to **9**.
    - The higher levels come at a cost of increased CPU usage on the web server.
    - In the experience of our developers, there seems to be little performance benefit above level **5** with EnterpriseOne.
    - If the web server becomes CPU constrained, this setting can be adjusted downwards.

EnterpriseOne HTML: Apache

- **Other key httpd.conf settings**

```
ThreadsPerChild=250
```

  - **EnterpriseOne version level requirements:** ALL
  - This should be set equal to the **number of concurrent users on the system across all JVMs**
  - Is often much too low “out of the box”
    - Default = 50
  - Symptoms: Web users timing out, unexplained errors in jasdebug log, etc.…

EnterpriseOne HTML: JVM parameters

WebSphere

- JVM **heap memory**
  - "Thumb" – start with 1 GB per JVM
  - **When thrashing occurs due to excessive garbage collection – this should be increased**

- JVM - inner HTML expires headers timeout setting

```
Dcom.peoplesoft.e1menu.ie.timeout="10" (or some other value)
```

  - **EnterpriseOne version level requirements:** 8.94 base
  - Set this in **Generic JVM properties** in WebSphere.
  - Internet Explorer has a bug in which **expiration headers in inner HTML are ignored**.
    - This can limit the efficacy of the expiration header solution to the WAN performance problem.
  - Creates a brief time-delay so that Internet Explorer has enough time to verify whether the image is in the cache, and then call the innerHTML property

EnterpriseOne HTML: JAS

- **JAS.INI – EnterpriseOne Web server configuration settings**

```
[OWWEB]
TimeWaitBeforeAutoResume=0
FetchAllPageSize=500
SectionSize=70
```

  - **Performance of the following operations is impacted by adjusting the above settings:**
    - **“Go to End”**
    - **Selecting a range of rows (*e.g. 1-100, 101-200, etc*)**
    - **Row-to-row**
  - **EnterpriseOne version level requirements: 8.94_J1**

EnterpriseOne HTML: JAS

- **JAS.INI – Multiple Browser fix**

```
[OWWEB]
AppLaunchNewBrowser=TRUE
```

- Performance of switching between two forms with large grids
  - **EnterpriseOne version level requirements: 8.94_U1**
  - This renders each application in a separate browser, eliminating the re-rendering of the grid DOM memory each time the window is selected by the user.
  - The switch from one application to another will then be as instantaneous as clicking on a new browser window.
  - Each browser will have links to all open applications, and each Browser will have the same menu state as the spawning window.
    - So - if a menu path has been traversed, the spawned window will maintain that state

EnterpriseOne HTML: JAS

JAS.INI / JDBJ.INI – Other key settings

- **JDBJ.INI**
  - Set this = **total max concurrent users**

```
[JDBj-CONNECTION POOL]
maxConnection=100
```

- **JAS.INI**
  - Set this = **max concurrent users per JVM**

```
[OWWEB]
MAXUser=50
```

- **Symptoms of inadequate settings : failed users / web errors**

EnterpriseOne HTML: client PC

- **HTML client is not a completely "thin" client**
  - **JavaScript** is downloaded and run locally
  - **DOM memory** elements used in grid rendering reside on local PC
    - Once allocated, they are never released by the browser
- **Processor speed of PC is a large factor**
  - Particularly when large grids are involved
  - Pentium IV hyper threaded processors seem to make a significant impact

EnterpriseOne HTML: client PC

- **Customer example 1**
  - Response times of grid loading operations on PCs of varying processor speeds
  - 750 rows / 45,000 cells:
    - 863 Mhz: 140 seconds
    - 1993 Mhz: 83 seconds
    - 2524 Mhz: 60 seconds
  - **Upshot:** PC **Processor speed** significantly impacts performance for large grids

EnterpriseOne HTML: client PC

- **Customer example 2**
  - Rotates desktops every 24 months.
  - **Standard desktop**:
    P4 / 512 MB / 40GB disk
  - **For users whose daily job activities require grid-intensive processing:**
    P4 dual processor / 1GB / 40gb disk.
  - By using these processors and the “Customize Grid” functionality, upload and download speeds comparable to fat client installs are achieved.
  - **Upshot**: **P4 dual processor PCs** significantly faster for large grids

EnterpriseOne HTML: client PC

- **Customer example 3**
  - Switching between apps & switching between rows in entry applications when a large grid is involved:
    - P3 / 800 MHz / 256 MB
  - Response times reduced significantly by **SectionSize** adjustment from 200 down to 70
    - ~70% reduction in response time: 53.7 seconds….to 17.1 seconds
  - Response times reduced significantly by **P4 PC (2.8 Ghz / 1 GB)**
    - ~70% reduction in response time: 53.7 seconds….to 16.3 seconds
  - Response times reduced by **90%** when BOTH were applied
    - ~70% reduction in response time: 53.7 seconds….to 5.5 seconds
  - **Upshots**:
    - **P4 PCs** significantly faster for large grids
      SectionSize parameter has significant impact on large grids.

EnterpriseOne HTML: client PC

- **Customer example 4**
  - 200 row fetch on different PCs
  - Large impact of Pentium IV
  - **Upshot**:
    P4 PCs significantly faster for large grids
    Memory not as large a factor as processor speed

Processor	CPU speed	Memory	Response time (secs)
P3	1.1	261	22
P4	1.5	261	12
P4	1.7	261	8
P4	2.0	1GB	7

EnterpriseOne HTML: client PC

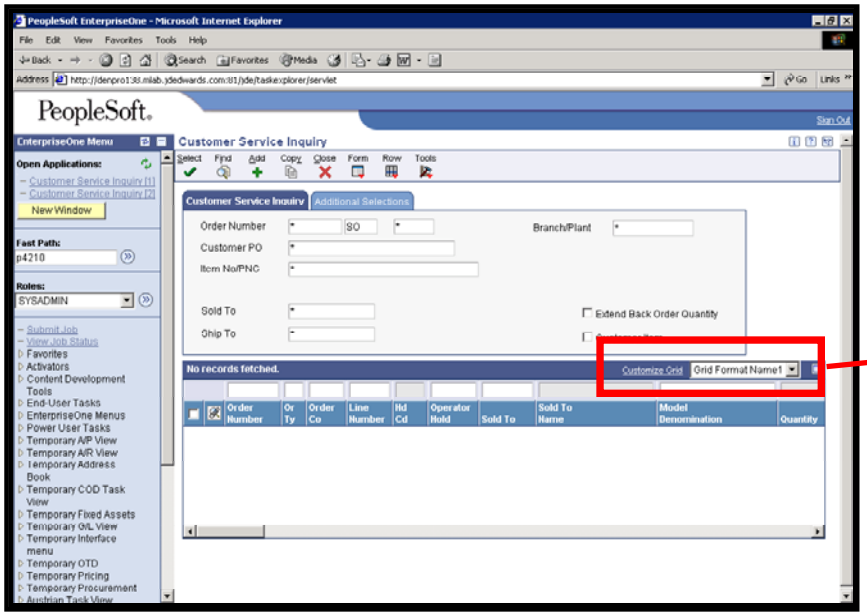
- **Grid rendering**
  - Performance modification: Cloning of DOM elements for large grids
    - **EnterpriseOne version Level Requirements:** 8.95_I2 or greater.
  - Grid rendering performance is sensitive to both:
    - **number of grid rows** on a form
    - **number of grid columns** on a form.
  - Grid rendering performance is addressed at each release

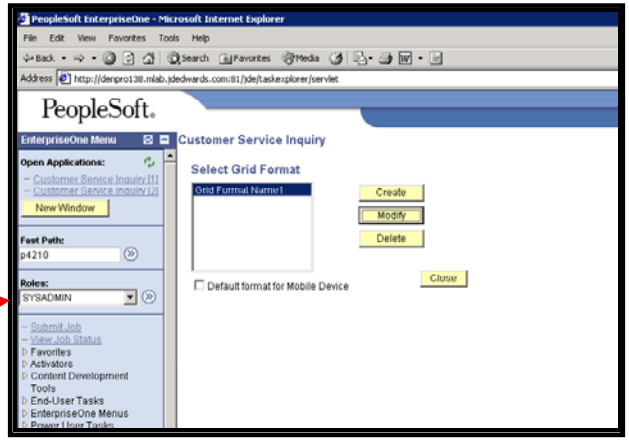
EnterpriseOne HTML: client PC

- **Customize Grid**
  - Use to reduce the number columns rendered.
    - This reduces the number of DOM elements processed.
    - It also eliminates the formatting of all the values in those grid cells.
  - Reducing 100 columns to 95 will not likely yield a large reduction in response time, but reducing 100 columns to 60 would likely have a large perceptible impact.
  - Many large transaction tables have 200+ columns
    - …but only a small fraction of these are really needed
  - Custom Grid formats can be deployed globally or per user

EnterpriseOne HTML: client PC

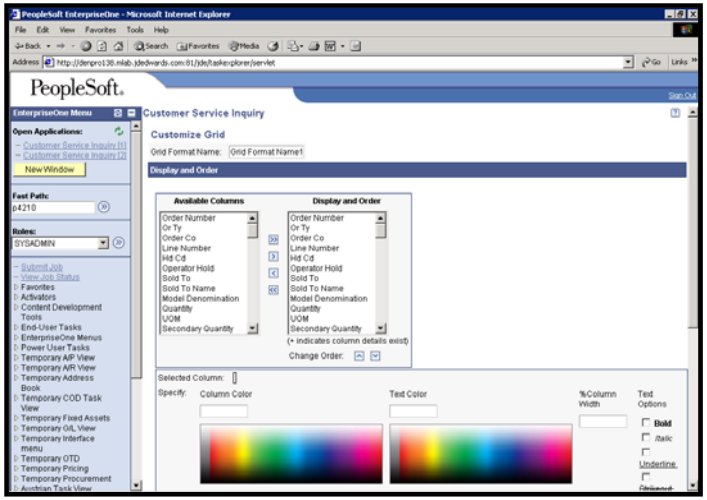
- **Customize Grid – select format**





EnterpriseOne HTML: client PC

- **Customize Grid – select columns**



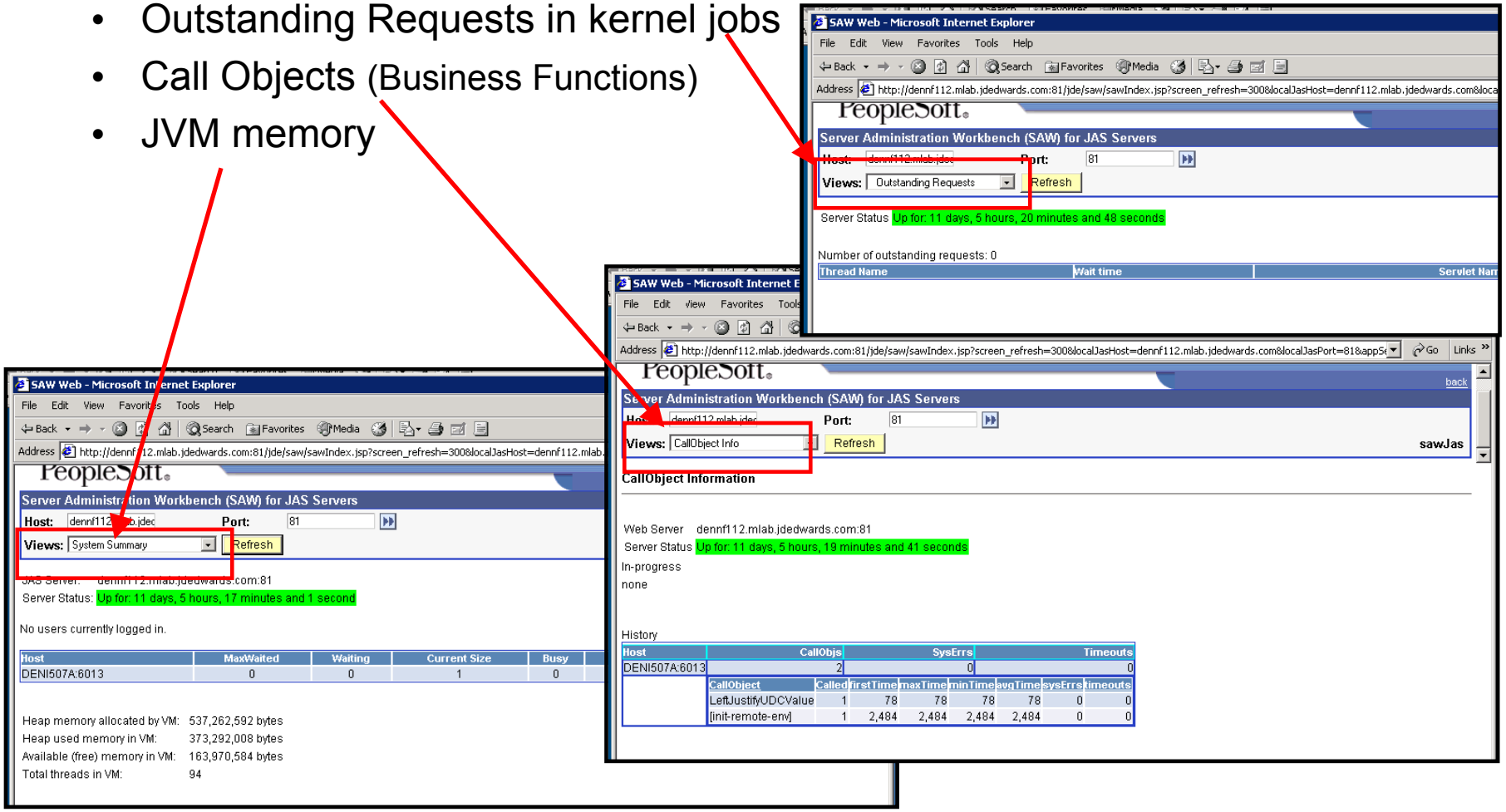
- **There is one caveat to this solution. If the grid columns drop to a value less than 60, the rowset size doubles. This can reduce the performance benefit.**
  - **Mitigation: Use the `SectionSize` JAS.INI setting to set the rowset size**
  - **This is a global setting**

EnterpriseOne HTML: Misc items

- **Mozilla Browser**
  - Version 1.07 has been observed to be more efficient / less “chatty” than Internet Explorer in terms of network round trips
    - Little data for Version 1.5
  - Only supported EnterpriseOne platform: Linux
  - Will work for many applications
    - Media Objects a known problem
    - Screen layouts / alignment potentially a problem
- **proxyTrace tool**
  - Free download which can be used to trace HTML traffic
- **Server Administration Workbench** (SAW)
  - Track JVM memory usage, Call Objects, backup in queues

EnterpriseOne HTML: Misc items

- **Server Administration Workbench** (SAW)
  - Outstanding Requests in kernel jobs
  - Call Objects (Business Functions)
  - JVM memory



EnterpriseOne HTML: Misc items

- **Network settings**
  - NIC cards set to Auto-Detect / Full Duplex
- **Debug is turned OFF in jaslog.properties**
  - "ERROR" not "DEBUG" in the first line.

```
jdelog.rootLogger=ERROR,JDELOG,JASLOG
jdelog.rootLogger=DEBUG,JDELOG,JASLOG
```

- **Use Internet Explorer 6.02**
  - Internet Explorer version 6.x is much faster than version 5.5.
  - IE 6.02 is the current MTR with 8.9 or higher

EnterpriseOne Enterprise Server

- **iSeries**
  - **Teraspace PTF**
    - Starting in **8.94** – binaries are compiled using teraspace memory
    - **If performance is degraded in iSeries following upgrade to 8.94 – particularly in UBEs**
      - There are IBM PTFs which must be applied
        - **V5R3**: PTF SI17503 or CUM 5207
        - **V5R2**: PTF SI17614 or CUM 5263
      - EnterpriseOne performance – particularly for UBEs – could be negatively impacted upon upgrade to 8.94 or higher if the appropriate teraspace PTF is not applied
      - A **large number of exceptions** on the system is a strong indicator of the problem.

EnterpriseOne Enterprise Server

- **iSeries**
  - **Row Security performance**
    - In ALL EnterpriseOne versions and ALL supported OS levels, the use of ROW SECURITY may significantly slow down any affected application.
    - Debug log reveals the problem: row-security enabled SELECTs contain strings of “BETWEEN” and NOT BETWEEN” clauses

```
SELECT  *  FROM TESTDTA/F41021  WHERE
( LIITM = 2979638.000000 AND LIMCU = '    00662150' AND LIPBIN = 'P' )  AND
( LIMCU NOT BETWEEN '         NAP' AND '         NAP' AND
  LIMCU NOT BETWEEN '        1000' AND '        1000' )
```

    - These SELECTs take abnormal amounts of time to process
    - **Resolution**: V5R3
      - In the QAQQINI, apply this setting `IGNORE_DERIVED_INDEX=*YES`
    - **Resolution**: V5R2
      - Requires **marker PTF SI07650**
      - The `IGNORE_DERIVED_INDEX=*YES` setting may also be required
      - The **REAL** recommendation is to upgrade to **V5R3**

EnterpriseOne Enterprise Server

- **iSeries**
  - **Pool Size & configuration**
    - A major factor, especially for UBE performance
      - "Thumb": 500MB allocated to the UBE subsystem per concurrent UBE as a start.
      - High levels of paging = indicator to increase pool size
    - Fixed Pool size often works better
  - **If you are on 8.95…**
    - **Take 8.95_I2 or later NOW**
    - **Reasons: performance of certain UBEs is impacted**
      - Pre-Payroll (R07200) will have a dramatically increased throughput
      - Low Level reason: Any applications which makes heavy use of JDECACHE will be impacted

EnterpriseOne Enterprise Server

- **Business Unit Security / SetID**
  - **All platforms**
  - **EnterpriseOne version level requirements**: **8.94_R1** and above
    - For 8.95, first included in **8.95_E1**
  - Key symptoms
    - Slow UBEs
    - Excessive I/O to several tables
      - F00941 / F00942 / F95311
  - **Workaround**: Place F00941 and F00942 in F98613 cache

EnterpriseOne Enterprise Server

- **Subsystem UBE jobs**
  - **All platforms**
  - Short-duration frequently-run jobs are good candidates to be run as subsystem UBEs
  - Eliminates repeated fixed cost of UBE startup overhead.
  - EnterpriseOne ships subsystem versions of many UBEs
  - With some development / consulting “know how”, subsystem jobs can be created for other UBE which meet with above description.

EnterpriseOne Enterprise Server

- **Subsystem jobs shipped with EnterpriseOne**

R0007Z1I Process Inbound Work Day Calendar - Subsystem
R004201 Authorize Prepayment Transactions Subsystem
R004202 Settle Prepayment Transactions Subsystem
R00460 Interoperability Generic Outbound Subsystem
R01010Z Batch Address Book Upload - Subsystem
R011110Z Contact Information - Subsystem
R03010Z Customer Master Batch Upload Subsystem
R04010Z Supplier Master Batch- Subsystem
R04110Z2 Voucher Batch Processor Subsystem
R09110Z Batch Journal Entry Subsystem Version
R09110ZS Store & Forward Subsystem Version
R09801 G/L Post Subsystem Version
R1201Z1I Inbound Subsystem Asset Master Processor
R1201Z1O Outbound Subsystem Asset Master Processor
R30006Z1I Process Inbound Work Centers - Subsystem
R3002Z1I Process Inbound BOM Transactions - Subsystem
R3003Z1I Process Inbound Routing - Subsystem
R30161Z1I Inbound Kanban Subsystem Transaction
R31113Z1I Inbound Inventory Issues Subsystem
R31114Z1I Inbound Completion Processor Subsystem
R31122Z1I Hours & Quantities Inbound Subsystem
R31410 Gen/Print Configured W.O's (Subsystem)
R3411 Initiate Subsystem Processing
R3411 Subsystem Message Processing
R4942Z1I Shipment Creation - Subsystem
R3460Z1I Forecast Transaction Inbound - Subsystem
R37470 Test Results Worksheet - Subsystem
R37900 Certificate of Analysis Extract - Subsystem
R40211Z Batch Transaction Editor in Subsystem
R4101Z1I Item Master Unedited Transaction Subsystem
R4210IC Create Intercompany Sales Order - Subsystem
R4210Z Sales Order Batch Trans. Editor - SUBSYSTEM
R42500 Batch Ship Confirm - SUBSYSTEM MODE
R42520 Print Pick Slips - Subsystem
R42565 Send Order E-mail - Subsystem
R42565 Print Invoice in Subsystem
R42950 subsystem submission of Price Cost Update
R42997 Inventory Commitment - Subsystem
R43092Z1I Receipt Routing Transactions Inbound - Subsystem
R4311Z1I Subsystem Inbound Purchase Order Batch
R43500 Print Purchase Orders- Subsystem Job
R45100 Assign, Recalculate and Reassign - Subsystem
R46171 Parallel Processing Subsystem Pick
R46171 Warehouse Subsystem Processing
R47011 EDI Inbound Purchase Order Edit/Update - Subsyste
R47016ZO Outbound POE Processor Subsystem
R470412 EDI Inbound Invoice/Match (Subsystem)
R47071 EDI Inbound Edit/Update-Subsystem
R47121 Product Activity Data Edit/Create Subsystem
R47127O Outbound Prod. Act. Data Subsystem-Update As

EnterpriseOne Performance: Summary

- **Summary**
  - **Web / HTML items**
    - httpd.conf: Apache Expires Headers
    - httpd.conf: Apache HTTP 2.0 compression
    - httpd.conf: ThreadsPerChild
    - JVM heap memory
    - JVM inner HTML timeout setting
    - JAS.INI settings
    - JDBJ.INI settings
    - PC processor speed
    - Customize Grid
    - Server Administration Workbench
  - **Enterprise Server items**
    - **iSeries**
      - If you are on **8.95** - **take 8.95_I2 or higher**
      - **Pool size / configuration**
      - **Teraspace PTFs** - **8.94** and higher
        - **V5R3**: PTF SI17503 or CUM 5207
        - **V5R2**: PTF SI17614 or CUM 5263
      - **Row Security**: - ALL EnterpriseOne versions
        - **V5R3**: IGNORE_DERIVED_INDEX=*YES
        - **V5R2**: PTF SI07650 + IGNORE_DERIVED_INDEX=*YES
    - **All platforms**
      - **8.94_R1 / 8.95_E1**- BU Security / SetID Fix
      - Subsystem jobs

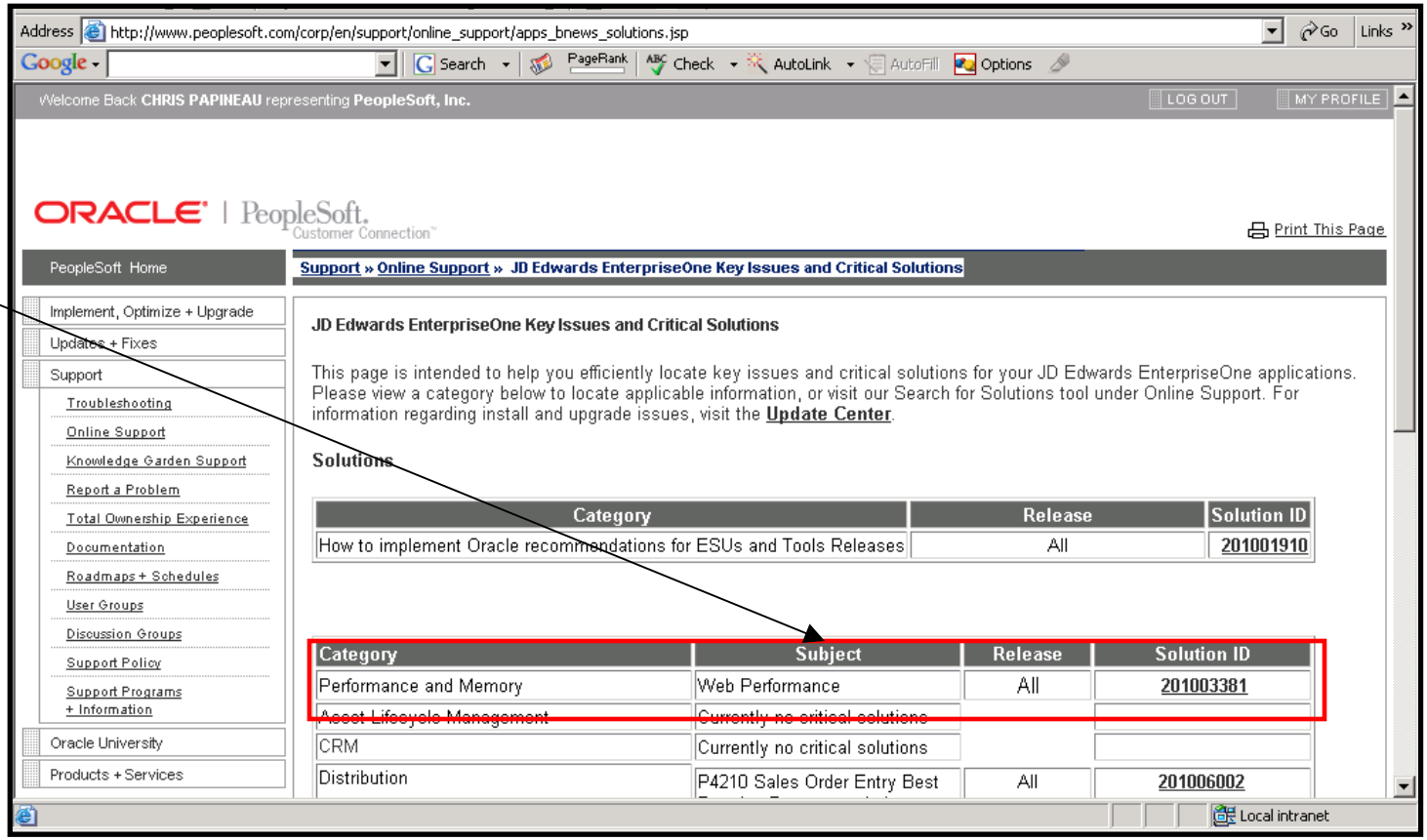
- **Always search application ESUs for current, relevant performance fixes**

EnterpriseOne Performance: Summary

- **More info: Customer Connection**

  Support | Online Support | **JD Edwards EnterpriseOne Key Issues and Critical Solutions**

Performance and Memory Solutions



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