Reducing Mainframe Costs
In a BIG way
Agenda

- What is NEON zPrime
- What NEON zPrime doesn’t do
- How NEON zPrime works
- NEON zPrime supported workloads
- Enabling NEON zPrime workloads
- NEON zPrime Installation and Customization
- The NEON zPrime Effect
- Summary
What is NEON zPrime

- NEON zPrime “facilitates” the movement of processing from a general purpose processor (CP) to a specialty processor (zIIP or zAAP)... It does not guarantee its movement

- NEON zPrime is a proprietary software solution governed by trade secrets. Details will not be publicly disclosed

- There is no publicly documented interface that facilitates this capability.

- There is no privately documented interface, that has been disclosed to NEON, that facilitates this capability

In other words, its ours... we own it!
Next step in lowering mainframe TCO

Legacy Applications

DB2 Distributed/ISV

Java/XML

Integrated Information Processor (zIIP)

2006

2009

NEON zPrime!

Integrated Facility for Linux (IFL)

1997

Integrated Coupling Facility (ICF)

2001

Application Assist Processor (zAAP)

2004

Cross-LPAR Communications

zLinux

2004

Cross-LPAR Communications

Java/XML

Integrated Information Processor (zIIP)

2006

NEON zPrime!

Integrated Facility for Linux (IFL)

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2004

Cross-LPAR Communications

zLinux
What NEON zPrime doesn’t do

- NEON zPrime does not:
  - Hook/Alter z/OS dispatcher
  - Hook/Alter Workload Manager (WLM)
  - Hook/Alter System Management Facility (SMF)
  - Hook/Alter Resource Measurement Facility (RMF)
  - Enable/Disable any type of processors on any LPAR

Your workload monitoring, management and reporting continue to operate according to your specifications
How NEON zPrime works

SYSA

IMS DB2 CICS BATCH TSO

zPrime Enabled

NEON Enterprise Software Server (NESS)

WLM Policies

z/OS Dispatcher

CP

zAAP

zIIP
NEON zPrime supported workloads

- CICS Transactions
- IMS MPPs (Transactions)
- IMS BMPs (Transactions, Online Batch)
- IMS IFPs (Transactions, Online Batch)
- IMS DLI or DBB (Batch Database)
- TSO/ISPF
- DB2 Application Programs
- DB2 Stored Procedures
- Batch Application Programs
- NEON IMS Utilities
NEON zPrime Installation and Customization

- Configure NEON Enterprise Software Server
  - Global customization through ISPF interface
  - Runs as started task or submitted job

- CICS Enablement
  - Implement PLT Startup Exit
  - JCL change and bounce CICS region

- IMS Enablement
  - Implement pre-initialization exit
  - JCL change and bounce IMS dependant region
NEON zPrime Installation andCustomization

- TSO Enablement
  - Assemble and link the ISPXDT exit
  - JCL change and log on to TSO

- DB2 Enablement
  - Relink DSN3@SGN & DSN3@ATH exits
  - Bounce the DB2 Subsystem

- Language Environment (LE) Initialization Exit
  - SMP/E Usermod
  - Standalone linkedit job

- Batch Wrapper
  - JCL change to job (PGM= and PARM=)
  - Optional STEPLIB/JOBLIB change
NEON zPrime for IMS Enablement

- IMS Pre-initialization Exit
  - JCL Change
  - IMS Proclib Change

- Batch Wrapper
  - JCL Change

- Language Environment (LE) Exit
  - SMP/E Usermod

- NEON IMS Utilities
NEON zPrime IMS Pre-initialization Exit

- Enables IMS MPP, BMP and IFP processing
- Copy `?neonhlq.LOAD(NSLZPIMS)` to the IMS Reslib
- Create/modify the pre-initialization proclib member (DFSINTxx)
- Modify the MPP, BMP and/or IFP job JCL to point to the pre-initialization proclib member
Create/modify the DFSINTxx member:

- Must be in the //PROCLIB DD in the BMP, MPP or IFP JCL

- Member name is DFSINTxx
  - Where xx is the Pre-initialization suffix

- Add NSLZPIMS to the list of modules in the DFSINTxx member
Modify BMP, MPP and IFP JCL

- Execution Parameter must specify the pre-initialization member name suffix.

- Jobstep must contain a //PROCLIB DD that contains the data set with the DFSINTxx member.
NEON zPrime Batch Wrapper

- Requires JCL Changes
  - EXEC PGM=, PARM=
  - STEPLIB/JOBLIB change

- Can add the batch wrapper modules to LPA to eliminate the STEPLIB/JOBLIB changes

- Limited intended use
  - Batch jobs that affect peak CPU utilization and are not supported by one of the other exits
  - “Normal” application programs
  - Does not support multi-tasking (subtasks) applications.
NEON zPrime Batch Wrapper Example

Current JCL:

```plaintext
//BIFA EXEC PGM=DFSRRC00,
//      PARM=(DLI,...)
//STEPLIB DD DSN=IMSA.SDFSRESL,DISP=SHR
//      DD DSN=IMSA.PGMLIB,DISP=SHR
```

New JCL:

```plaintext
//BIFA EXEC PGM=NSLZPAPP,
//      PARM=(DFSRRC00,DLI,...)
//STEPLIB DD DSN=IMSA.SDFSRESL,DISP=SHR
//      DD DSN=IMSA.PGMLIB,DISP=SHR
//      DD DSN=?neonhlq.LOAD,DISP=SHR
```
Language Environment Exit Enablement

- Affects all LE-enabled programs
  - Not limited to IMS applications

- SMP/E usermod for global/production use
  - Updates LE runtime library - usually in Linklist
  - No JCL changes required

- Linkedit job for local/testing use
  - Link to non-global library
  - Add to STEPLIB/JOBLIB
NEON IMS Utilities

- All NEON IMS utilities zPrime enabled

- Requires a zPrime product key

- Requires a NESS be present on same LPAR
  - If not present, job continues without enablement

- Automatic
  - No configuration required to enable
Customizing the NEON Server (NESS)

- Define default settings
  - Can probably just press enter on specified options

- `ex ‘?neonhlq.EXEC(neoncntl)’`

- Select NEON Enterprise Software Server
NESS Global Customization Panel

**NEON Enterprise Software Server Customizable Parameters V06.01.01**

**Command ---**

- **Product Load Library**: MSL.U61D.LOAD
  - Note: These are your current default parameters.

**NEON Enterprise Software Server Parameters:**

- **Message Data set Name**: MSL.U61D.MSG
- **Message Language**: ENU
- **Sysout class**: *
- **Subsystem Scan Interval**: 0120 (1 - 3600 seconds)

**NEON Enterprise Software Server**

- **Enable Load**: MSL.U61D.ENABLE.LOAD

Press ENTER to update END to save and exit

CANCEL to exit ignoring any changes made since the last update
Enabling NEON zPrime Workloads

- Uses documented exits for all system enablement
  - Implementation of exits are well understood by appropriate systems personnel
  - Implementation of exits are documented in appropriate product documentation

- zPrime exits and batch wrapper do not force enablement... only make call to the NESS

- Everything to be enabled must be specified via the zPrime Enablement Console

- ex ‘?neonhlq.EXEC(zprime)’
zPrime Online Enablement Schedule
zPrime Enablement Console

Option -->

NEON Enablement Library:
NSL.v610_ENABLE_LOAD

0 Defaults - Specify processing defaults
User ID : ALL3
System ID : SYSA

1 Schedule 1 - ONLINE SCHEDULE
Version : 01.02.01

2 Schedule 2 - Unnamed Table

3 Schedule 3 - Unnamed Table

4 Schedule 4 - Unnamed Table

5 Criteria - Job Selection Criteria

6 Save - Save updates to permanent table

7 Commands - Activate/De-activate permanent table

A Archive - Manage Archived Tables

C CPU Usage - CP, ZIIP and ZAAP utilization

G Globals

H Messages - Enablement Table update successful

X EXIT - Terminate

Connected to SYSA.NEONESOFT.COM port 23  2/14  10:21:47 IBM-3279-2 - NESSA046
zPrime Enablement Selection Criteria

Option -->

NEON Enablement Library:
MSL.061D.ENABLE_LOAD

0 Defaults - Specify processing defaults
1 Schedule 1 - ONLINE SCHEDULE
2 Schedule 2 - BATCH SCHEDULE
3 Schedule 3 - Unnamed Table
4 Schedule 4 - Unnamed Table
5 Criteria - Job Selection Criteria
6 Save - Save updates to permanent table
7 Commands - Activate/De-activate permanent table
A Archive - Manage Archived Tables
G CPU Usage - GP, ZIIF and ZAAP utilization
G Globals
M Messages - Enablement Table update successful
X EXIT - Terminate

Connected to SYSA.NEONESOFT.COM port 23
2/14
10:40:22 IBM-3278-2 - NESSA046
# zPrime Enablement Selection Criteria

![Image](image.png)

## zPrime Enablement Selection Criteria

<table>
<thead>
<tr>
<th>System</th>
<th>Jobname</th>
<th>StepName</th>
<th>ProcStep</th>
<th>PGM Name</th>
<th>Inc</th>
<th>Exc</th>
<th>Sch</th>
<th>User</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>1</td>
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<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:30</td>
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<tr>
<td></td>
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<td>2</td>
<td></td>
<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:31</td>
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<td></td>
<td>1</td>
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<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:31</td>
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<tr>
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<td></td>
<td></td>
<td>1</td>
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<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:32</td>
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<td></td>
<td>2</td>
<td></td>
<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:33</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:36</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ALL3</td>
<td>20991022</td>
<td>10:34</td>
</tr>
</tbody>
</table>

---

Connected to SYSA.NEONESOFT.COM port 23

2/15

10:36:47 IBM-3278-2 - NESSA046

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Create permanent zPrime Enablement Table

Option -->

NEON Enablement Library:
MSL.V61D.ENABLE LOAD

0 Defaults - Specify processing defaults
1 Schedule 1 - ONLINE SCHEDULE
2 Schedule 2 - BATCH SCHEDULE
3 Schedule 3 - Unnamed Table
4 Schedule 4 - Unnamed Table

5 Criteria - Job Selection Criteria

6 Save - Save updates to permanent table
7 Commands - Activate/De-activate permanent table

A Archive - Manage Archived Tables
C CPU Usage - CP, ZIIP and ZAAP utilization
G Globals
M Messages - Enablement Table update successful
X EXIT - Terminate

Connected to SYSA.NEONESCFT.COM port 23
### zPrime Enablement Table Save

#### Command

Press enter to save or end to cancel

<table>
<thead>
<tr>
<th>Table</th>
<th>New Name</th>
<th>Version</th>
<th>User</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSL2PRMT</td>
<td>NSL2PRIN</td>
<td>01.02.01</td>
<td>ALL3</td>
<td>2009/10/22</td>
<td>10:42</td>
</tr>
<tr>
<td>NSL2PRIM</td>
<td>NSL2PRIN</td>
<td>01.02.01</td>
<td>ALL3</td>
<td>2009/10/22</td>
<td>10:42</td>
</tr>
</tbody>
</table>

**************************************************** Bottom of data ****************************************************
zPrime Enablement Table created.

<table>
<thead>
<tr>
<th>Table</th>
<th>New Name</th>
<th>Version</th>
<th>User</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSL2PRIM</td>
<td>NSL2PRH0</td>
<td>01.02.01</td>
<td>ALL3</td>
<td>20091022</td>
<td>10:42</td>
</tr>
<tr>
<td>NSL2PRH0</td>
<td>NSL2PRM1</td>
<td>01.02.01</td>
<td>ALL3</td>
<td>20091022</td>
<td>10:40</td>
</tr>
</tbody>
</table>

Connected to SYSA.NEONESOFT.COM port 23 | 10:43:36 IBM-3279-2 - NESSA046

Changes Saved
Activate the zPrime Enablement Table

Option -->

NEON Enablement Library:
MSL.061D.ENABLE.LOAD

0 Defaults - Specify processing defaults
1 Schedule 1 - ONLINE SCHEDULE
2 Schedule 2 - BATCH SCHEDULE
3 Schedule 3 - Unnamed Table
4 Schedule 4 - Unnamed Table
5 Criteria - Job Selection Criteria
6 Save - Save updates to permanent table
7 Commands - Activate/De-activate permanent table
A Archive - Manage Archived Tables
C CPU Usage - CP, ZIIP and zAAP utilization
G Globals
M Messages - Enablement Table update successful
X EXIT - Terminate

Connected to SYSA.NEONESOFT.COM port 23  2/14  10:40:22 IBM-3278-2 - NESSA046
**zPrime Enablement Command Interface**

![Image of zPrime Enablement Command Interface]

### NEON zPrime(tm) Enablement Library:
- **NSL.V61D.ENABLE LOAD**

#### Line Cmds:
- A: Activate
- D: De-Activate
- F: Force Activate
- R: Refresh Table
- P: Stop the Server

<table>
<thead>
<tr>
<th>SSID</th>
<th>System ID</th>
<th>Library Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEAS</td>
<td>SYSA</td>
<td>NSL.V61D.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSA</td>
<td>NSL.V61D.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSC</td>
<td>NSL.V61D.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSC</td>
<td>NSL.V61D.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSC</td>
<td>NSL.V61D.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSC</td>
<td>NSL.V61D.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSA</td>
<td>PRV1.ZPRIME12.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSA</td>
<td>PRV1.ZPRIME12.ENABLE LOAD</td>
</tr>
<tr>
<td>NESS</td>
<td>SYSA</td>
<td>PRV1.ZPRIME12.ENABLE LOAD</td>
</tr>
</tbody>
</table>

---

Connected to SYSA.NEONESOFT.COM port 23 | 2/15 | 10:46:43 IBM-3279-2 - NESSAD46
Refresh the zPrime Enablement Table

<table>
<thead>
<tr>
<th>SSID</th>
<th>NESU</th>
<th>NESW</th>
<th>NESX</th>
<th>NESY</th>
<th>NESZ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SYSA</td>
<td>SYSB</td>
<td>SYSC</td>
<td>SYSD</td>
<td>SYSE</td>
</tr>
</tbody>
</table>

Connected to SYSA.NEONE5CFT.COM port 23   3/28   10:47:41  IBM-3279-2 - NESSA046

About to issue command to NESU on SYSA
F NESU,SET ZPRIME REFRESH

Press ENTER to confirm
Type CANCEL to exit
Refresh Command Processing Completed
Server reports the table changes.
View processor utilization
zPrime Processor Information

```
Processor  Type  Processor  Count  Processor  Utilization
-----------  ------  -----------  --------
      GP     3          34
zAAP     1          19
zIIP     1           6

Processor: 2098-L03 (z10 BC)
4 Hour MSU Avg: 8
CEC MSU rating: 43
zAAP Norm. Factor: 5.16796875
zIIP Norm. Factor: 5.16796875

Press ENTER to refresh or END to exit
```
## The NEON zPrime Effect

<table>
<thead>
<tr>
<th>Workload type</th>
<th>Customer Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>CICS</td>
<td>44%</td>
</tr>
<tr>
<td>TSO/ISPF</td>
<td>75%</td>
</tr>
<tr>
<td>Batch Wrapper</td>
<td>84%</td>
</tr>
<tr>
<td>DB2</td>
<td>89%</td>
</tr>
<tr>
<td>IMS MPP</td>
<td>91%</td>
</tr>
<tr>
<td>IMS BMP</td>
<td>93%</td>
</tr>
</tbody>
</table>
Issues/Problems with NEON zPrime

- **z/OS v1.9 and below**
  - TPUT SRB specifies CPU affinity resulting in intermittent S072-8 abends. Affinity points to a zIIP or zAAP however, the generated SRB is not eligible for zIIP or zAAP processing
  - Does not produce a dump - only logrec data
  - No adverse affect to processing

- **Batch Wrapper**
  - SMF 30 record shows the program name as NSLZPAPP when NESS is not running
  - Not an issue when using the LE, TSO/ISPF, IMS, CICS or DB2 exits
Summary

- NEON zPrime is trade secret technology that enables your business application program processing to be moved to your low-cost specialty processor.

- No hooks to the z/OS Dispatcher, SMF, RMF or WLM. Your system continues to operate the way you’ve configured it.

- Implemented within LE, TSO/ISPF, IMS, DB2 and CICS through documented exits.

- As close to no-risk as you can get
  - No system failures or subsystem failures

- All the NEON IMS products have been enhanced to enable the NEON zPrime interface.

- You can purchase both zIIPs and zAAPs. NEON zPrime will balance workload assignments between them.
Questions?