

# Charge Backs Shift to Reflect Economies Brought by SOA



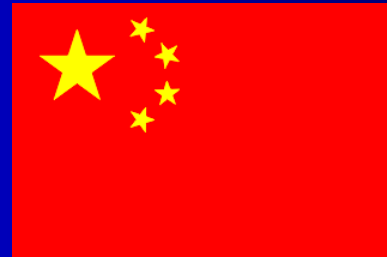
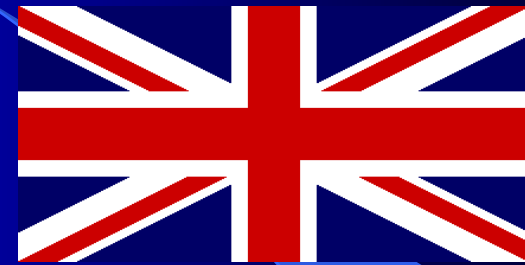
November 5, 2009



# WGR Worldwide Market Presence

## 35 Distributors Worldwide

- **Thompson Financial**
- **Dialog**
- **Global Information GII**
- **MarketResearch.com**
- **ResearchandMarkets.com**
- **Electronics.ca**



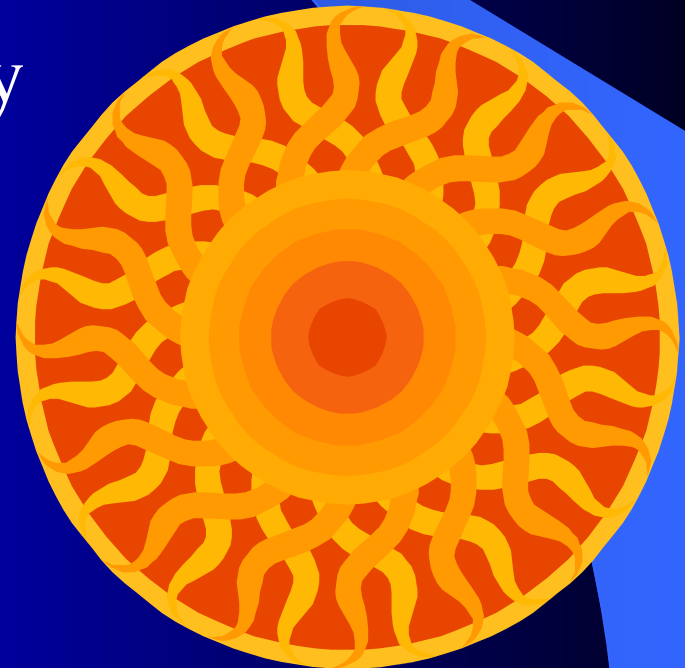
# Platform ROI / TCO Chargebacks



- Comparative chargeback ROI / TCO analysis of transactions per second or Web services invocations
- Permits comparative chargeback numbers for System z vs. Distributed servers on \$ per transaction base
- Platform decision tool
- Application by application basis

# Shared Memory Key

- Distributed servers failover to only one other server – no shared memory
- System z manages memory
- System z shares memory
- System z workload sharing optimized



Calculate



# Server to MIPS Conversion

## Server to MIPS Conversion Calculator

2. Application Workload Profile

Scenario 1

Go

Display Calc List

### Step 2. Application Workload Profile

Size Categories are Small (MQ or Swift message), Medium (TPC-C Order Entry or Inventory Posting to a Database Transaction), Large (TPC-E Large Brokerage Transaction), Extra Large (Complex set of Linked Transactions)

Transactions and Invocations	Small	Medium	Large	Extra Large
Transaction Management (CICS)	0	0	100	0
Presentation Logic	0	150	200	0
Database Intensive	0	124	0	0
Web Service Invocations	0	500	0	0

### Time Measurement

Timespan of Transactions and Invocations (Hours) 0.00027777

### System z Model

System z Model IBMSystemz9EC2094-703 [CHANGE MODEL](#)

### System z Workload

	% GPP MIPS Used	Total GPP MIPS Allocated	GPP MIPS Used (Actual)	% zIIP MIPS Used	Total zIIP MIPS Capacity
System z Workload	111.50%	1,409	1,571.43	0.00%	580

### Server Model

Server Model DellPowerEdgeR900 [CHANGE MODEL](#)

### Server Workload

	% CPU Cycles Used	Total CPU Cycle Capacity (GHz)	CPU Cycles Used	% Offload Cycles Used	Total Offload Cycles Capacity
Server Workload	312.28%	23	73.20	0.00%	0

### Server to MIPS Ratio

	# Production Servers	Actual MIPS Used	# CIM Servers	Shared Workload MIPS	Server to MIPS Ratio
Server to MIPS Ratio	16.0	1,571.43	33.00	314.29	9.52

Proceed to Cost Overview [GO BACK](#)

# Concept for Distributed Server CIM

- Introduce concept of compute intensive module (CIM)
- Makes server processing comparable to MIP calculation
- CIM includes test, development, presentation, production, database, and backup servers
- CIM includes storage, networking, and cabling , software licenses
- Sets up server CIM to MIPs conversion

# Cost Distributed Server CIM Per Day

- \$9.82 cost per CIM server per day
- Peak time calculations are accounted for
- Workload offsets take into consideration differences in managing types of processing
- Includes labor and security costs
- Includes virtualization shared workload calculations
- Shared workload improves efficiency

# Mainframe SOA

- Business-centric and IT-centric SOA achieve integration by leveraging connectivity and reuse to achieve flexible response to changing business conditions



- Shared workload is more efficient



# SOA Reduces IT Runtime Costs

- IT Run time costs consume 80% budget
- Reducing IT run time costs competitive priority



- Invest in growing the business
- SOA provides flexible response to changing market conditions

# System z Runs WebSphere Efficiently

- Distributed data centers are big, expensive, and employ a lot of people compared to System z data centers
- System z runs one box with about three people
- New charge back systems needed



# Distributed Server Data Center vs. System z



- Data centers cost \$60 million to \$410 million
- System z costs \$4 million



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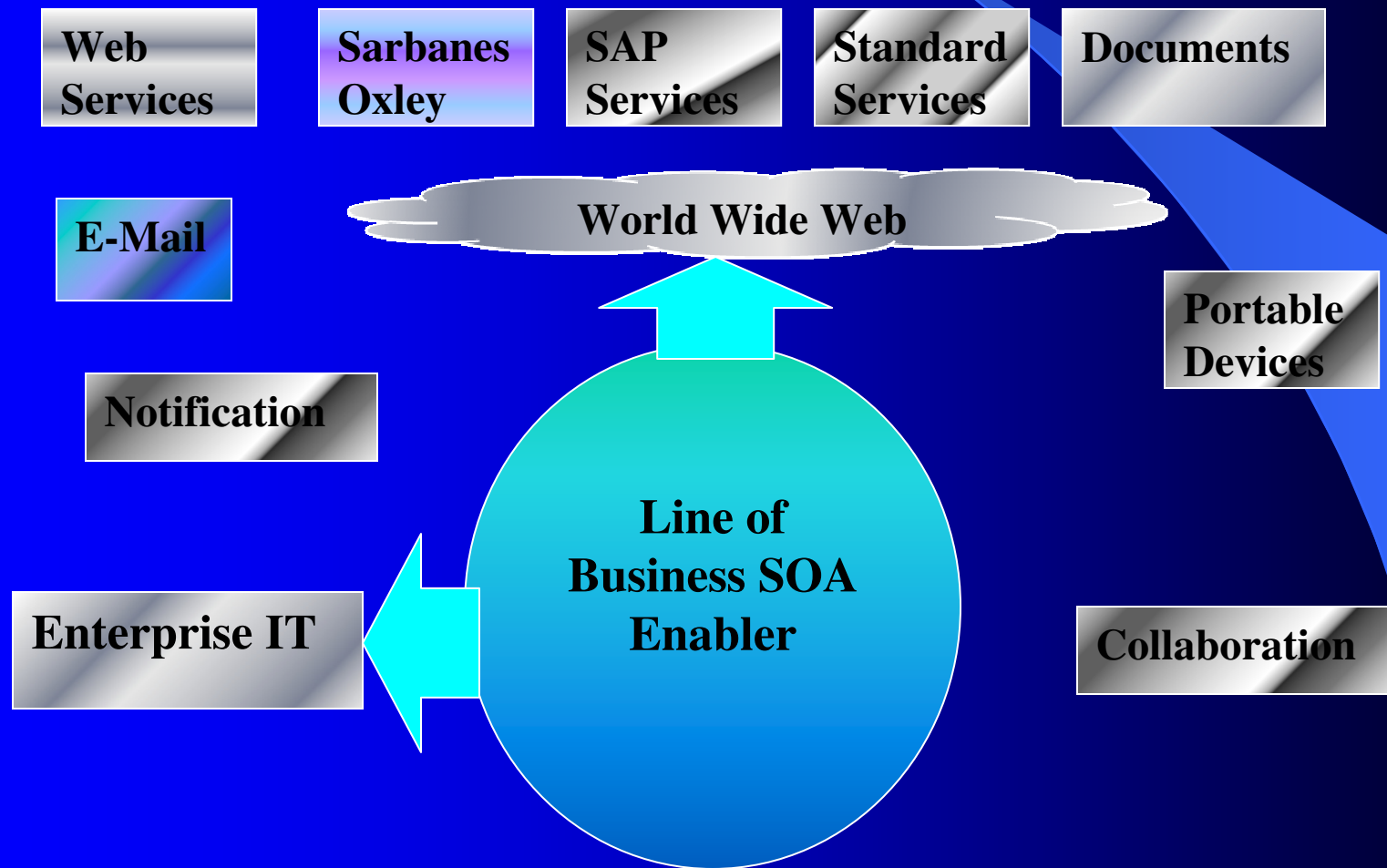
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# SOA Creates Efficiency

- **SOA supports innovation**
- **Distributed systems compared to mainframe systems as shared workload analysis**
- **Analysis is \$ per day for MIPS and for CIMs**
- **SOA supports flexible response to changing market conditions**
- **Decrease run time costs**



# Calculate Chargeback on Application Basis



# Calculate Chargeback on Application Basis



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- Line of Business Uses SOA
- Line of Business Develops Applications



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Model: Enterprise\_Computing --> Overview  
Session: enterprise computing 17

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Summary Page: **Overview**      Navigate Pages: 1. Overview Expanded       Current Scenario: Scenario 1                        

Cost Analysis of Distributed Systems vs. Mainframe for Single Application	Initial	Unit	2009	2010	2011	2012	2013
Total Costs to Achieve SLA	1,415.5	\$000	1,386.1	1,428.4	1,472.6	1,517.6	1,565.0
Disaster Recovery	231.5	\$000	236.4	241.6	247.2	253.1	259.5
Hardware	11.0	\$000	-1.7	-1.7	22.0	-1.7	-1.7
Scalability	27.9	\$000	6.1	5.9	5.7	5.3	4.9
Network	321.9	\$000	3.6	4.6	5.6	6.6	7.7
Security	317.3	\$000	304.5	309.5	318.0	327.4	337.2
Software	49.0	\$000	49.5	50.0	50.5	51.0	51.5
Infrastructure	92.9	\$000	94.9	97.0	99.3	101.7	104.4
<b>Total System Advantage</b>	<b>2,466.9</b>	<b>\$000</b>	<b>2,079.3</b>	<b>2,135.3</b>	<b>2,220.8</b>	<b>2,261.0</b>	<b>2,328.4</b>

# Labor Costs are 70% of IT Costs



**Labor costs make up a large part of Total IT costs.... in excess of 70%**

**There is a significant difference between System z and distributed server costs for labor**

**SOA reduces labor costs on system z**

**On average the costs of labor for distributed servers programming is less than the System z systems programming costs**



# WinterGreen Research ROI/TCO

Features and Benefits Analysis -- At least ten to one cost

Advantage of System z over Distributed System

**Security is \$317,000 less per year**

## Security Cost Analysis



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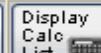
sec

Current Scenario:

Scenario 1

Go

Scenarios



Calculate

Security Cost Analysis - Mainframe Versus Distributed System	Current	Unit	2006	2007	2008	2009	2010
<a href="#">Analyst Comments - Security</a>							
Total Annual Security Costs - Distributed System	330.5	\$000	340.4	350.7	361.2	372.0	383.2
Total Annual Security Costs - Mainframe	13.3	\$000	13.7	14.1	14.5	14.9	15.4
Cost Differential		Total	2006	2007	2008	2009	2010
<b>Security Cost Differential - Mainframe vs. Distributed System</b>	<b>317.3</b>	<b>\$000</b>	<b>326.8</b>	<b>336.6</b>	<b>346.7</b>	<b>357.1</b>	<b>367.8</b>



# Network Efficiency: System z saves \$321,000 per year



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Summary Page:

## Network

Current Scenario:

Scenario\_1



Scenarios



**Calculate**

### Network System Cost Comparisons on Mainframe vs. Distributed Servers

Initial	Unit	2008	2009	2010	2011	2012
---------	------	------	------	------	------	------

[Network Analyst Comments](#)

### Network and Quality of Service (QoS) Voice VoIP Systems On Distributed Systems

Current	Unit	2008	2009	2010	2011	2012
---------	------	------	------	------	------	------

[Network Equipment and Cabling Costs Distributed Servers](#)

51.6	000\$	1.4	2.4	3.3	4.3	5.3
------	-------	-----	-----	-----	-----	-----

[Network Quality of Service \(QoS\) Costs Distributed Servers](#)

288.0	000\$	3.0	3.1	3.1	3.1	3.2
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**Total Network and Quality of Service (QoS) Costs On Distributed System**

339.6	000\$	4.5	5.4	6.4	7.4	8.4
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### Network and Quality of Service (QoS) On Mainframe

Current	Unit	2008	2009	2010	2011	2012
---------	------	------	------	------	------	------

[Network Equipment and Cabling Costs Mainframe](#)

13.6	000\$	0.4	0.4	0.4	0.4	0.4
------	-------	-----	-----	-----	-----	-----

[Network Quality of Service \(QoS\) Voice VoIP Systems Costs Mainframe](#)

4.2	000\$	0.5	0.5	0.4	0.4	0.3
-----	-------	-----	-----	-----	-----	-----

**Total Network and Quality of Service (QoS) Costs Mainframe**

17.8	000\$	0.9	0.9	0.8	0.8	0.7
------	-------	-----	-----	-----	-----	-----

### Cost Differential

Initial	Unit	2008	2009	2010	2011	2012
---------	------	------	------	------	------	------

[Network Systems Costs Comparison Mainframe vs. Distributed Servers](#)

321.9	000\$	3.6	4.6	5.6	6.6	7.7
-------	-------	-----	-----	-----	-----	-----

321.9

# Infrastructure Efficiency: System z saves \$118,200 per year

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Summary Page:

Infrastructure

Current Scenario:

Scenario 1

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## Infrastructure - Mainframe Cost Analysis

Infrastructure Analyst Remarks

Distributed Server Infrastructure Costs

Mainframe Infrastructure Costs

### Cost Differential

Infrastructure Cost Differential -- Distributed System Vs. Mainframe

	Current	Unit	2008	2009	2010	2011	2012
Distributed Server Infrastructure Costs	118.290	000\$	120.823	123.543	126.459	129.584	132.927
Mainframe Infrastructure Costs	0.096	000\$	0.098	0.100	0.102	0.104	0.107
<b>Total</b>	<b>118.2</b>	<b>Unit</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
Infrastructure Cost Differential -- Distributed System Vs. Mainframe	118.2	000\$	120.7	123.4	126.4	129.5	132.8

118.2

- Less electricity, less floor space, less cooling
- System z is the green machine and more

# Data Centers Run Out of Electricity

- All over the world data centers are running out of electricity.

Energy calculations  
for Google:



1 million computers each with 2 processors.  
Processors consuming 235 watts of power.  
Electricity costs \$494 million for the direct costs,  
With indirect costs, total electricity bill estimated  
at \$1.5 billion per year.

# Back-up and Disaster Recovery System z Saves \$4.2 Million Per Year



## ROI ENGINE Real-Time Investment Analysis

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app int Scenario 1  Scenarios

Estimated Annual Growth (activity) =  %

Application Integration Development Costs Distributed vs. Mainframe	Current	Unit	Year 1	Year 2	Year 3	Year 4	Year 5
Analyst Remarks		000\$					
Development On Distributed Systems	4,864.7	000\$	4,966.8	5,076.1	5,192.9	5,317.5	5,450.4
Development On Mainframe	633.2	000\$	646.5	660.7	675.9	692.1	709.4
<b>Costs</b>			Year 1	Year 2	Year 3	Year 4	Year 5
<b>Different Development Costs</b>	<b>4,231.5</b>	<b>\$</b>	4,320.3	4,415.4	4,516.9	4,625.3	4,741.0

**\$4.2 Million**



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# Service Level Availability (SLA) System z saves \$1.6 Million per year

Summary Page: **SLA Service Level Availability** Current Scenario: Scenario 1

SLA - Analysis of Costs Needed to Achieve 5 Nines of Availability And Costs of Not Having 5 Nines of Availability	Current	Unit	2008	2009	2010	2011	2012
<a href="#">SLA Analyst Comments</a>							
SLA - Distributed Server Cost Analysis	Initial	Unit	2008	2009	2010	2011	2012
<a href="#">Labor Costs For Hardware Technicians Needed to Achieve SLA On Distributed System</a>	288.0	(000)\$	296.7	306.3	316.4	326.7	337.8
<a href="#">Labor Costs For Software Developers Needed to Achieve SLA On Distributed System</a>	345.0	(000)\$	355.4	366.9	379.1	391.3	404.7
<a href="#">Costs of Software Needed to Achieve SLA On Distributed System</a>	147.4	(000)\$	26.5	26.5	26.5	26.5	26.5
<a href="#">Business Cost of SLA Downtime On Distributed System</a>	845.8	(000)\$	871.4	899.5	929.4	959.4	992.3
<b>Total Labor, Software, and Business Costs to Achieve SLA On Distributed System</b>	<b>1,626.2</b>	<b>(000)\$</b>	<b>1,550.0</b>	<b>1,599.2</b>	<b>1,651.5</b>	<b>1,703.8</b>	<b>1,761.3</b>
SLA - Mainframe Cost Analysis	Initial	Unit	2008	2009	2010	2011	2012
<a href="#">Labor Costs For Hardware Technicians Needed to Achieve SLA On Mainframe</a>	1.4	(000)\$	1.4	1.5	1.5	1.6	1.6
<a href="#">Labor Costs For Software Developers Needed to Achieve SLA On Mainframe</a>	3.0	(000)\$	3.1	3.2	3.3	3.4	3.5
<a href="#">Costs of Software Needed to Achieve SLA On Mainframe</a>	3.0	(000)\$	0.1	0.1	0.1	0.1	0.1
<a href="#">Business Cost of SLA Downtime On Mainframe</a>	0.1	(000)\$	0.0	0.0	0.0	0.0	0.0
<b>Total Labor, Software, and Business Costs to Achieve SLA On Mainframe</b>	<b>7.5</b>	<b>(000)\$</b>	<b>4.6</b>	<b>4.8</b>	<b>4.9</b>	<b>5.1</b>	<b>5.3</b>
Cost Differential	Total	Unit	2008	2009	2010	2011	2012
<b>Cost Differential For Labor and Software To Achieve Service Level Availability On Mainframe vs. Distributed Systems</b>	<b>1,618.8</b>	<b>(000)\$</b>	<b>1,545.4</b>	<b>1,594.4</b>	<b>1,646.5</b>	<b>1,698.8</b>	<b>1,756.1</b>

**\$1.6 Million**

# SOA Used for New Workload

Data Center economics analysis depends on optimizing Linux workload for System z

## Performance tuning new workload

- Decrease hidden recursion
- Eliminate loops
- Reduce calls to include files
- Optimize database accesses
- Manage memory allocation

Memory Stack



All New Workload is Web Based

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# Financing Advantages

- Expense or capitalize the cost
- Sometimes after an upgrade the total charges are less
- Unplugged units still accrue charges
- Trade in used or unused equipment as part of a financing package
- Residual value can be significant
- Tax advantages to the purchaser



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# Charge-backs

- **SOA charge-back is on application by application basis**
- **SOA reduces cost of infrastructure**
- **Shared work load and shared memory key advantages of System z**



# Summary

- The cost of a System z typically is 10 times less than the cost of a distributed system
- The cost of the infrastructure is significantly less for the System z
- The cost of security is inherent in System z architecture

IBM Transformation:  
Major IT Virtualization Initiative

Mainframe as a Green  
Machine - The Green Stripe

IBM

