

The Crystal Ball Revealed:

The Future of Mainframe Based Computing

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Agenda

- The Mainframe---Where is it going?
 - Perspective on where we've been
 - The “essence” of computing
 - How does the Mainframe keep pace?
- zSeries Futures and the Real Crystal Ball...

Where is the Mainframe Going?

- Where have we been?

“The Future Ain’t What it Used to Be”

- Yogi Berra

Where is the Mainframe Going?

- 1990s---Mainframe threatened
 - VSE in particular, very challenged
 - The entire movement to “Client/Server”
 - Anything but a mainframe
 - Client/Server products and vendors promised computing Utopia
- But what did it all really mean?

Where is the Mainframe Going?

- It added up to some conversions
 -and many failed conversions and horror stories
- FootWear Management Company
 - Justin/Nocona/Tony Lama Boot Brands
- Lessons learned made the mainframe solution survive....again



Where is the Mainframe Going?

- The real concept of Client/Server is outdated
 - Focus was on physically distributing the data and/or application logic
 - Promised cost savings, ease of use
 - Reality was enormous cost, complicated solutions that never delivered



Where is the Mainframe Going?

- Network computing dominates the world
- Pervasive connections/pervasive “computing”
- Any Information from Anywhere
- Universal interface via web browser



Where is the Mainframe Going?

- The world is betting on e-business
 - IBM certainly is!



- To manage an e-business network you need the right infrastructure...
 - Performance
 - Mainframe's well-balanced design and focus on commercial computing
 - Reliability
 - IBM first company to quote the 5 "9"s – 99.999%
 - Security
 - Legacy of 30+ years of building industrial strength security solutions
 - Capacity
 - Unmatched ability to scale
 - Manageability
 - Single system, or system complex means one set of skills, one set of software

The Essence of Computing

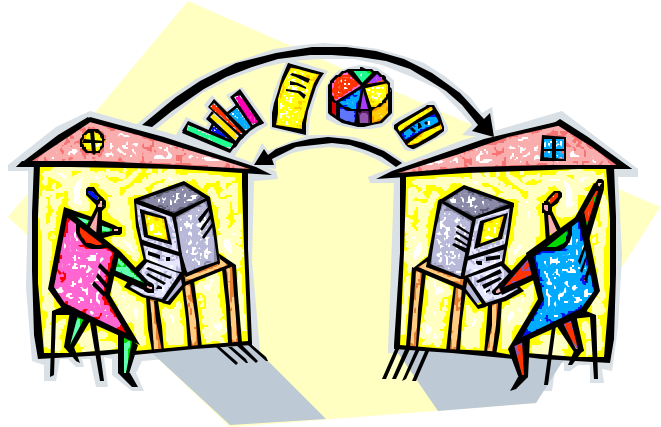
- Regardless of platform or environment there are only 4 real elements
- All hardware and software is geared to process the same elements
 - Data
 - Processing Logic
 - Communications/Transport
 - Presentation

The Essence of Computing...

- Data
 - Database
storage/access/organization/manipulation
- Processing Logic
 - Software used to do *something* with the data (find it, sort it, change it, store it, present it)

The Essence of Computing...

- Communications/Transport
 - Could be hardware wires connecting devices
 - Could be telecommunications infrastructure used for transport
 - All use some sort of protocol, or agreed-upon behavior
- Presentation
 - Could be visual—e.g. a CRT, a Web Browser, a Windows App
 - Could be printed to paper



The Essence of Computing...

- After years of competition for the kingdom on ALL fronts, “**universality**” is taking over
- The first, and most essential ingredient was to find a common “language”
- The glue to allow everything else to “communicate and transport”

X.25

HDLC

Appletalk

NetBeui

TCP/IP

Net Bios

Bi sync

IPX/SPX

DecNet

SDLC

The Essence of Computing...

- Presentation phase is also resolved
- The Web Browser as the universal interface
- Everyone knows how to use--globally
- The key is transforming presentation into browser-based access for interactivity (For the mainframe, 3270→ HTML)

The Essence of Computing...

- Solution is needed for Data and Processing Logic
 - Both represent tremendous investment in time and money
 - Most often, both are serving the needs of the existing platform
 - The needs develop when “extension” to other systems or platforms is required
 - Almost constantly now due to interconnectivity
 - IBM claims 60% of the world’s data still on mainframes

The Mainframe – The Next Steps

- With communication and presentation supplied, data and logic are last
- The old approach → the “Re-” solutions
 - Re-write, re-deploy, re-engineer, re-host
- The new approach → standardize and “re”-use
 - Can be done by continuing to embrace and support emerging standards and facilities



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The Mainframe – The Next Steps

- “Web Services” is emerging as the answer
- Web Services can provide:
 - ❑ Remote Procedure Call (RPC) type interface
 - ❑ Component interface mechanism
 - ❑ Enterprise Application Integration (EAI)
 - ❑ Standardizing portal technologies
 - ❑ Means of linking businesses over the Internet

The Mainframe – The Next Steps...

- Web Services deployment
 - Transform presentation to universal viewer (HTML)
 - Standardize and normalize data to remove platform characteristics
 - eXtensible Markup Language (XML)
 - Allows dynamic definition and normalization of data using standard “markup language”
 - Derivative of SGML
 - Published by the “W3C” in 1996
 - Transforms data to universal exchange language/format



The Mainframe – The Next Steps...

- XML versus HTML
 - HTML not “extensible”
 - HTML has vocabulary to define how it looks
 - XML provides capabilities to allow the data to be defined

The Mainframe – The Next Steps...

- HTML for presentation...

```
<!-- The original html recipe -->
<HTML>
<HEAD>
<TITLE>Lime Jello Marshmallow Cottage Cheese Surprise</TITLE>
</HEAD>
<BODY>
<H3>Lime Jello Marshmallow Cottage Cheese Surprise</H3>
My grandma's favorite (may she rest in peace).
<H4>Ingredients</H4>
<TABLE BORDER="1">
<TR BGCOLOR="#308030"><TH>Qty</TH><TH>Units</TH><TH>Item</TH></TR>
<TR><TD>1</TD><TD>box</TD><TD>lime gelatin</TD></TR>
<TR><TD>500</TD><TD>g</TD><TD>multicolored tiny marshmallows</TD></TR>
<TR><TD>500</TD><TD>ml</TD><TD>cottage cheese</TD></TR>
<TR><TD></TD><TD>dash</TD><TD>Tabasco sauce (optional)</TD></TR>
</TABLE>
<P>
<H4>Instructions</H4>
<OL>
<LI>Prepare lime gelatin according to package instructions...</LI>
<!-- and so on -->
</BODY>
</HTML>
```

The Mainframe – The Next Steps...

- HTML presentation...

Lime Jello Marshmallow Cottage Cheese Surprise

My grandma's favorite (may she rest in peace).

Ingredients

Qty	Units	Item
1	box	lime gelatin
500	g	multicolored tiny marshmallows
500	ml	Cottage cheese
	dash	Tabasco sauce (optional)
		Instructions 1. Prepare lime gelatin according to package instructions...

The Mainframe – The Next Steps...

- XML can deliver data, and application access

```
<?xml version="1.0"?>
<Recipe>
  <Name>Lime Jello Marshmallow Cottage Cheese Surprise</Name>
  <Description>
    My grandma's favorite (may she rest in peace).
  </Description>
  <Ingredients>
    <Ingredient>
      <Qty unit="box">1</Qty>
      <Item>lime gelatin</Item>
    </Ingredient>
    <Ingredient>
      <Qty unit="g">500</Qty>
      <Item>multicolored tiny marshmallows</Item>
    </Ingredient>
    <Ingredient>
      <Qty unit="ml">500</Qty>
      <Item>Cottage cheese</Item>
    </Ingredient>
    <Ingredient>
      <Qty unit="dash"/>
      <Item optional="1">Tabasco sauce</Item>
    </Ingredient>
  </Ingredients>
  <Instructions>
    <Step>
      Prepare lime gelatin according to package instructions
    </Step>
    <!-- And so on... -->
  </Instructions>
</Recipe>
```

The Mainframe – The Next Steps...



- Web Services deployment
 - Simple Object Access Protocol (SOAP)
 - XML Based protocol
 - Message based exchange of distributed application components and information
 - Universal Description, Discovery and Integration (UDDI)
 - SOAP APIs to enable inter-enterprise integration
 - Web Services Description Language (WSDL)
 - XML Vocabulary for describing Web Services interfaces
 - All developed by IBM, Microsoft and others

The Mainframe – The Next Steps...

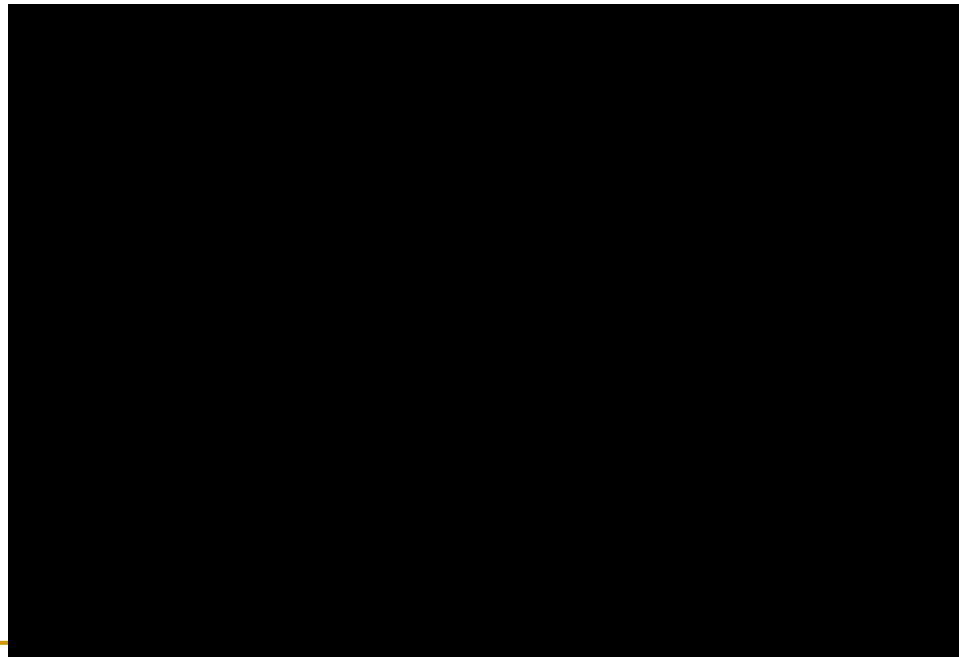
- Web Services deployment...
 - This allows any data, stored or accessed in any format to be exchanged
 - It also allows for access to the business logic
 - “Peer-to-Peer” application integration and access
 - Connect and exchange with many e-business and e-commerce apps including IBM WebSphere, Microsoft BizTalk Server and others
 - 60% of the world’s data and applications now accessible!

The Mainframe – The Next Steps...

- By integrating and offering Web Services the mainframe can continue to meld into the world of servers
- Data and Processing logic now available over the Internet infrastructure
 - ☑ Communications
 - ☑ Common Presentation
 - ☑ Access to data
 - ☑ Access to proven business logic

Current State of the “Mainframe”

- IBM reports first increase in mainframe revenue since 1989
- Extensive print and TV advertising for the very first time!!



Current State of the Mainframe...

- Server consolidation a reality
- Linux on zSeries provides industrial strength “host” for server farms
- zSeries Design and Architecture makes it feasible



Where is the Mainframe Going?

- Important to chart your course:

"You got to be very careful if you don't know where you're going, because you might not get there."

- Yogi Berra