Evolution of Linux and System z in Sicoob

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Sicoob

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Session Number 14997
Agenda

- Credit Cooperativism
- What is Sicoob?
- Virtualization and Consolidation Overview
- Timeline 2006 - 2013
- Difficulties and Challenges
- IT Drivers
- 2013 Perspective
- Benefits
Cooperatives Around the World

North America 8.164
Caribbean 433
South America 1.750
Europe 2.321
Africa 18.221
Asia 19.798
Oceania 326
Credit Cooperatives in Brazil

05 National Confederations
38 Central Cooperatives
1,273 Singular Cooperatives
02 Cooperative Banks

4,825 Service points
56,178 Direct jobs
5,8 Milhões Costumers

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Sicoob X-Ray

Members: 2,419,031
Cooperatives: 529
Centrals: 15
Confederation: 1
Bank: 1
US$ 17 Billions of Assets
Products Offered by Sicoob

- Payments (Wire Transfer)
- Private Pension
- Investments
- Official Resources
- Loans
- Cash Account
- Personalized Service
- Capital Account
- Insurance
- Consortium
- Debit and Credit Cards
## Major Banks in Brazil – Points of Service

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Institution</th>
<th>PoS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1º</td>
<td>Banco do Brasil</td>
<td>6.910</td>
</tr>
<tr>
<td>2º</td>
<td>Bradesco</td>
<td>6.025</td>
</tr>
<tr>
<td>3º</td>
<td>Itaú Unibanco</td>
<td>4.721</td>
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<tr>
<td>4º</td>
<td>Santander</td>
<td>3.942</td>
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<tr>
<td>5º</td>
<td>Caixa Econômica Federal</td>
<td>3.054</td>
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<tr>
<td>6º</td>
<td><strong>Sicoob</strong></td>
<td><strong>2.091</strong></td>
</tr>
<tr>
<td>7º</td>
<td>HSBC</td>
<td>1.268</td>
</tr>
</tbody>
</table>
Timeline – 2006
Before Consolidation and Virtualization Project

- One Datacenter (No Redundancy)
- Entry Level Equipments
- Variety of Vendors and Models
- Equipment without warranty
- Software without support
- Heterogeneous architecture
- Low availability
- High Horizontal Growth
Virtualization and Consolidation Project

The strategy of Consolidation and Virtualization of Sicoob’s computing infrastructure brought the dynamism, flexibility and scalability necessary to be inserted at the scenario of high-tech companies. As a result, it reflected on a technological infrastructure fast enough to growth and follow the expansion of the business while it leverages new opportunities.

As other benefits gained it worths to mention the reduction of maintenance costs, licensing, management, power consumption, Data Center’s footprint, and computational resources optimization. Also the ability of moving logical systems between servers and sites ensuring a high availability and an increased RAS level.
Timeline - 2007

- 210 blade servers + 90 rack servers (300 servers)
- middle-range servers (8 servers)
- 2 Itanium servers (2 servers)

Total CPU – 1056 cores
Average consumption (CPU and Memory): 45%

Total power consumption – 259 KWh
Total heat dissipation – 883.961 BTUh

Total monthly cost: US$ 50.349,60
Difficulties and challenges

- Granularity of hardware and programming languages;
- Delivery model based on Metaframe technology;
- In-house system underperforming;
- Lack of strategic direction and executive support;
- Low maturity of virtualization-based solutions, including performance optimization and support levels;
- Deprecated and unprepared technology for virtualization;
IT directions

- Establishment of Committees and Political Groups;
- Technological guideline:
  - Secure, available and updated solutions;
  - Focus on business growth;
  - Products and services monitoring;
  - Quality control;
  - Automation;
  - Saving licensing;
- Social and environmental responsibilities.

- IT Strategic and Operational Planning;
  - IT Process Control;
  - Mapping and automating strategic and operational processes.
New IT directions

SICOOB IT STRATEGY

IT MANAGEMENT  
FASTER BUSINESS GROWTH  
IT RISK MANAGEMENT  
NEW IT ARCHITECTURE  
MONITORING  
IT GEOGRAPHICAL CONTINGENCY  
VIRTUALIZATION  
CAPACITY PLANNING  
LICENSE REDUCING SOFTWARE
New replacement proposal
The New Systems Direction

Microsoft Windows
Citrix
Microsoft .NET
Visual Basic
Microsoft SQL Server
IBM System z
IBM DB2
IBM WebSphere
SUSE
IBM Cognos
Pure Data
VMware
Timeline – 2007
Consolidation and Virtualization Project Begins

- Linux and System z begins
- Acquisition of first Mainframe z9
- z/VM version 5 release 4
- First High-End Storage IBM model DS8300
- Acquisition of SAN Brocade DS4800
- Adopted a Backup Library IBM TS3500
Timeline – 2008
First Steps of Linux and System z Evolution

- Mainframe z9 replaced to Mainframe z10
- More processing capacities
- Adopt mixed technology for z/Linux based on OS running on DASD and Data disk on FCP
- Approximately 50 guests running on z10
- Datacenter almost collapses with full capacity
Timeline – 2009
New Datacenter Comes

- Build a New Datacenter which will come the Primary
- Starts the Geographical Contingency Project
- Preparing systems for Disaster Recovery
- Comply with Central Bank regulations
- Backup Library TS3500 upgraded
- More than 100 z/Linux guests
Timeline – 2010
Geographical Contingency Starts

- New Mainframe z196 M49 with 16 IFL for new Datacenter
- Acquisition of another High-End Storage DS8300
- Start Disaster Recovery for the most critical systems
- Adopted Version of z/VM 6.1
- Starts using Dirmaint
- Old Datacenter becomes Secondary
- More than 150 z/Linux guests
Timeline – 2011
New Era of Sicoob’s IT

- DS8300 Storages upgraded to DS8700 on both sites
- Upgraded Legacy Backup Library Quantum located on Secondary Site
- Remote Replication starts via DWDM
- Geographical Contigency comes synchronous
- z/VM upgraded to version 6.2
- z/Linux guests upgrading to Suse 11 SP 2
- Running 250 z/Linux Guests
Timeline – 2012
Expanding System z and Linux

- New Mainframe z196 M80 with 36 IFL
- Mainframe z196 M49 upgraded with more 20 IFL
- Acquisition of appliance IBM PureData for DataWarehouse
- New Business Intelligence Architecture
- New IBM High-End Storage DS8800
- Green IT Project launches
- The Estrategic IT Proposal made in 2007 done
- Running 350 guests on z/Linux
Timeline – 2013
Linux and System z High-Availability

- Mainframe z196 M80 expands with more 24 IFL
- Mainframe z196 M49 expands with more 11 IFL
- 4 SAN equipment DCx model comes
- Storage DS8800 upgraded to 300 TB
- High-Availability starts with SSI and LGR on 2 Mainframes z196
- First Non-Production environment on z/OS using DB2
- More than 450 z/Linux guests
Overview of Sicoob’s IT Infrastructure

• Primary Site

 2 Mainframes z196
 2 Storages DS8700/8800
 1 Tape Library TS3500
 5 High-End Intel Servers
 15 Middle Range Servers
 4 Directors SAN

• Secondary Site

 1 Mainframe z10
 1 Storage DS8700
 1 Tape Library iScalar
 1 High-End Intel Servers
 3 Middle Range Servers
 4 Directors SAN
System z Architecture

**Primary Site**

**Mainframe z196 M80**
- Processors: 80 IFLs
- Memory: 1792 GB
- LPAR: 6
- SSI: 2
- Systems:
  - Banking Core
  - Monitoring
  - Application Servers
  - Data Banks

**Mainframe z196 M49**
- Processors: 47 IFLs | 1 CP
- Memory: 1136 GB
- LPAR: 6
- SSI: 1
- Systems:
  - Business Intelligence
  - Banking Core
  - Monitoring
  - Application Servers
  - Data Banks

**Secondary Site**

**Mainframe z10 E26**
- Processors: 26 IFLs
- Memory: 768 GB
- LPAR: 4
- Systems:
  - Banking Core
  - Application Servers
  - Data Banks

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2013 Perspective – Resources Utilization

- 18 Middle-range (296 servers)
- 6 High end (605 servers)
- 3 Mainframes (450 servers)
2013 Perspective – Resources Utilization

18 Middle-range
296 servers

6 High end
605 servers

3 Mainframes
450 servers

ACQUISITION COSTS
US$ 16,150,000.00

INFRASTRUCTURE MANAGEMENT
COSTS - US$ 1,065,000.00

ANNUAL COST WITH ELECTRICAL
CONSUMPTION - US$ 257,500.00

ANNUAL COST WITH SOFTWARE LICENSE
US$ 5,600,000.00
2013 Perspective – Power consumption and heat dissipation

- **18 Middle-range 296 servers**
  - Power Consumption – 18KWh
  - Dissipation – 63.403BTUh
  - Monthly Cost - US$ 3,500.00

- **6 High end 605 servers**
  - Power Consumption – 48KWh
  - Dissipation – 163.796BTUh
  - Monthly Cost - US$ 9,300.00

- **3 Mainframes 450 servers**
  - Power Consumption – 44KWh
  - Dissipation – 150.146BTUh
  - Monthly Cost - US$ 8,500.00

**Monthly power consumption cost**

**US$ 21,300.00**
Scenario without technological guideline – 2013 Perspective

1,457 Blades
1,457 servers

71 Middle-range

Total monthly cost: US$ 234,000.00

- High cost of power consumption
- High cost of software licensing
- High cost manageability
- Reduction of Data Center space
- Low resilience, availability and scalability
- Increased costs with network assets / security
Strategic Comparison

2007

1457 physical Servers 0 VMs

No directions

2013

310 physical Servers 0 VMs

Targeting Strategy

27 physical servers 1350 VMs
## Financial Comparison

<table>
<thead>
<tr>
<th>Costs</th>
<th>Current Scenario</th>
<th>Without Virtualization Scenario</th>
<th>Differential</th>
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</thead>
<tbody>
<tr>
<td>Acquisition</td>
<td>US$ 16,150,000.00</td>
<td>US$ 15,200,000.00</td>
<td>+ 6.25%</td>
</tr>
<tr>
<td>Licensing</td>
<td>US$ 5,600,000.00</td>
<td>US$ 11,500,000.00</td>
<td>- 105%</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>US$ 257,500.00</td>
<td>US$ 2,800,000.00</td>
<td>- 987%</td>
</tr>
<tr>
<td>Management</td>
<td>US$ 1,065,000.00</td>
<td>US$ 2,130,000.00</td>
<td>- 100%</td>
</tr>
<tr>
<td>Additional Cost</td>
<td>-</td>
<td>US$ 4,100,000.00</td>
<td>-</td>
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</tbody>
</table>

**Acquisition Cost Differential**
- **US$ 950,000.00**

**Annual Cost Differential**
+ **US$ 13,607,500.00**

Total: + **US$ 12,657,500.00**
Benefits

• Power consumption reduction
• Licensing costs reduction
• Reduction of administrative overhead
• Flexibility and Scalability
• High availability (lead to geographical contingency)
• **Provides** standardization of infrastructure
• Easy system’s management (legacy environments)
• Reduced administration and maintenance support
• **Reuse** of resources (more efficient use of hardware)
• Disaster Recovery
• **Easier administering** and **implementing** of infrastructure capacity planning
• Prepared for an industrial environment IT
One of the socio-environmental initiatives at SICOOB is reducing carbon emissions to contribute for a more sustainable environment, a significant pillar of its strategic planning. This action involves a conscious use of computational resources while optimize its use to meet business demands.

Therefore Sicoob has been replacing some of its equipments, such as blade servers, to more efficient solutions. As a consequence, it has been observed a reduction of power consumption, heat dissipation and computing resources, allowing a significant reduction of carbon footprint.

This new approach converges with a socio-environmental initiative of "Green IT" as defined at the strategic planning and maintains the technologic apparatus ready for a modern industrial IT environment.

Source: If applicable, describe source origin

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Sustainability

When the Sicoob’s equipments were replaced, 18,800,000 Kw/year of power was saved and 913 tons of CO₂/year were not sent into the atmosphere. This represents:

- Power Consumption of 6,000 houses/year
- 5,700 trees/year to replant
- 323 Cars emitting CO₂ /year
Linux and System z Milestones

- 1st IFL in Latin American with 153 IFLs
- 1st z/Linux guests in Latin American with more than 450 VMs
- 1st to run z/VM version 6 release 2 on Production in Latin America
- 1st to run z/VM version 6 release 3 on Production in Latin America
- 1st to run SSI and LGR in Brazil
- 1st to run SSI and LGR in Brazil on 2 CECs
2013 Awards
The Future

- Build the 3rd Datacenter
- SSI and LGR on Remote Site
- Update z/VM versions 6.1 and 6.2 to version 6.3
- Update z/Linux versions 10SP4 and 11SP2 to version 11SP3
- Deliver 1st Production environment in z/OS
- Improve Capacity Planning
- Upgrade Mainframe z10 to zEC12
- Provide services to cooperatives with Cloud Computing Model
- Social Network, Mobility, Collaboration and SaaS
Thank You

We are delivering in the present and constructing the future of our cooperatives!

Questions?