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Evolution of Linux and System z in Sicoob

Luis Eduardo Franca
Sicoob

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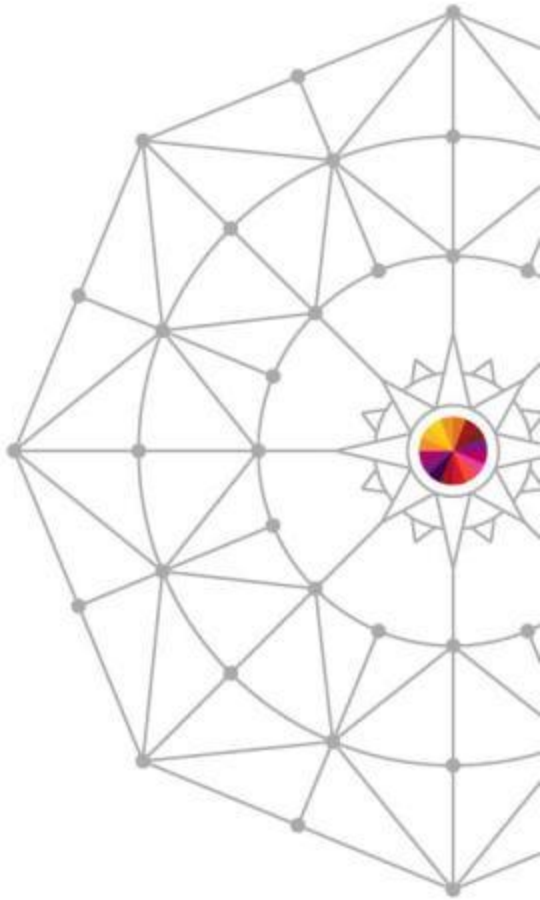
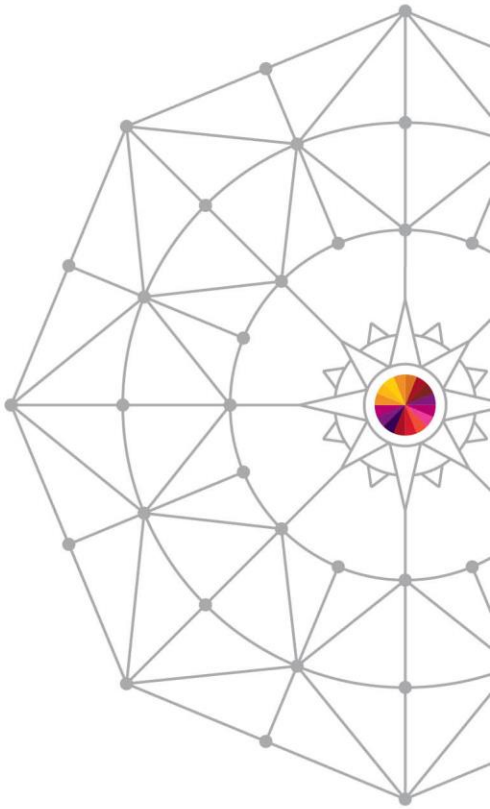


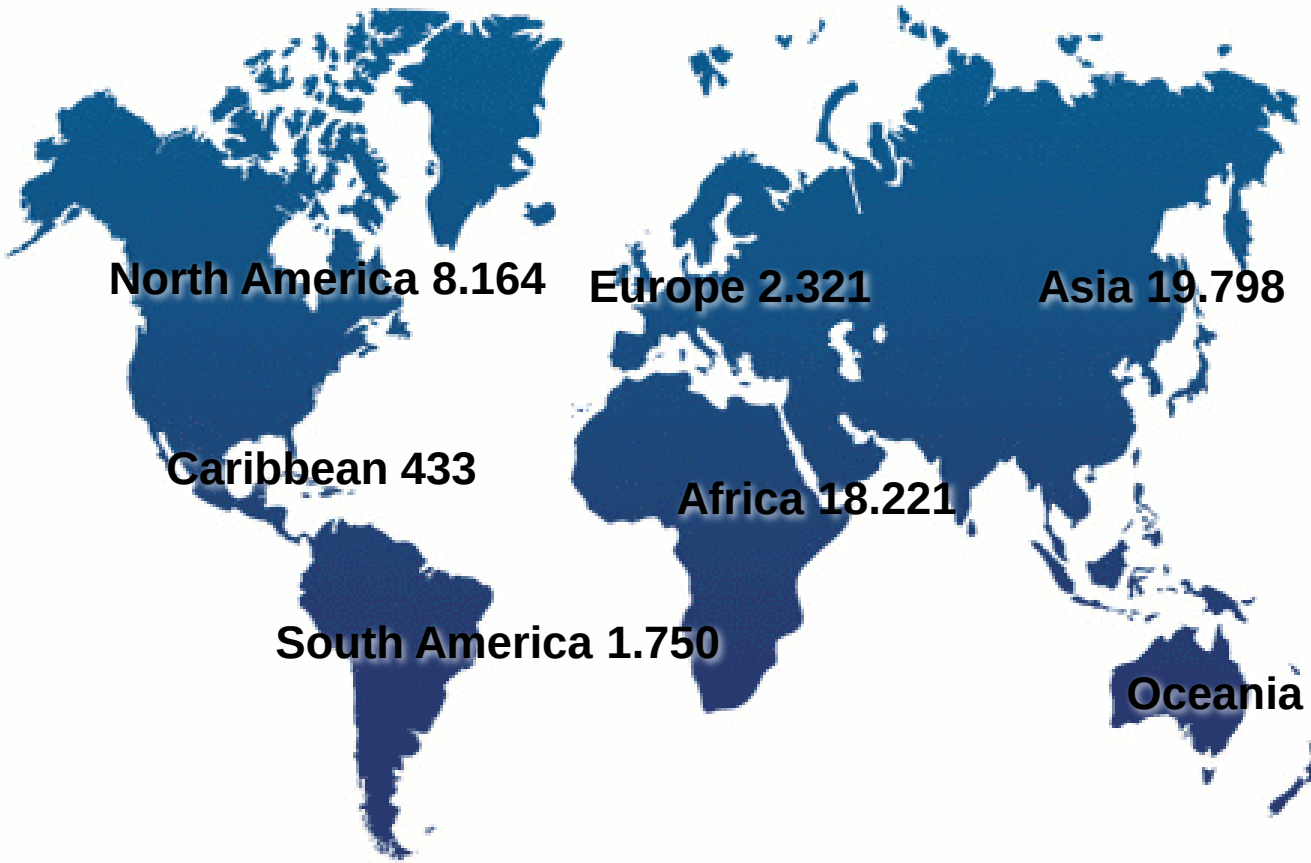
SHARE in Anaheim

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



Credit Cooperatives in Brazil

05
National Confederations

38
Central Cooperatives

1.273
Singular Cooperatives

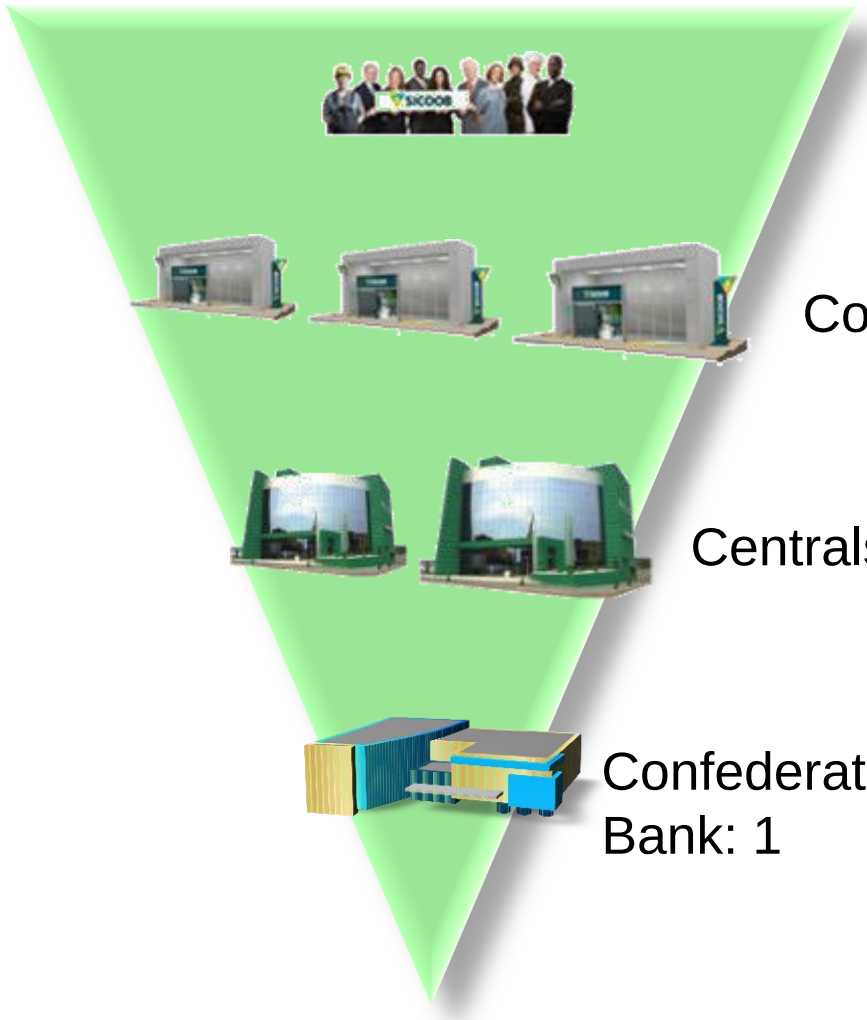
02
Cooperative Banks

4.825
Service points

56.178
Direct jobs

5,8 Milhões
Costumers

Sicoob X-Ray



Members: 2.419.031

Cooperatives: 529

Centrals: 15

Confederation: 1
Bank: 1

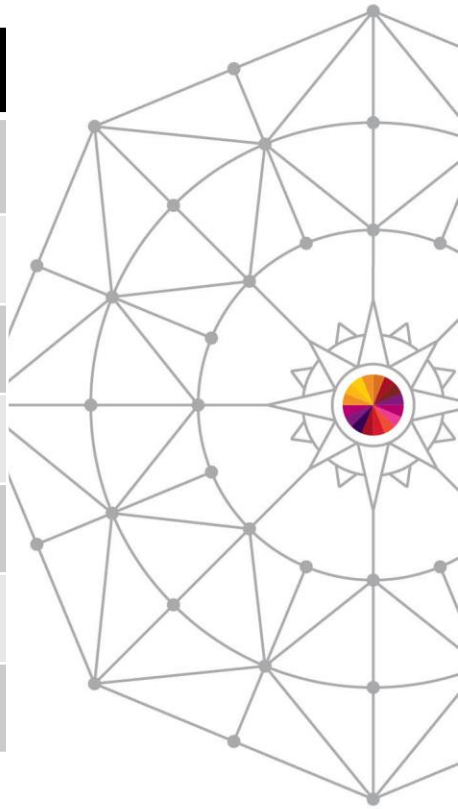
US$ 17 Billions of Assets

Products Offered by Sicoob

- Payments Wire Transfer
- Private Pension
- Investments
- Capital Account
- Official Resources
- Insurance
- Loans
- Consortium
- Cash Account
- Debit and Credit Cards
- Personalized Service

Major Banks in Brazil – Points of Service

Ranking	Institution	PoS
1º	Banco do Brasil	6.910
2º	Bradesco	6.025
3º	Itaú Unibanco	4.721
4º	Santander	3.942
5º	Caixa Econômica Federal	3.054
6º	**Sicoob**	**2.091**
7º	HSBC	1.268



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)
		

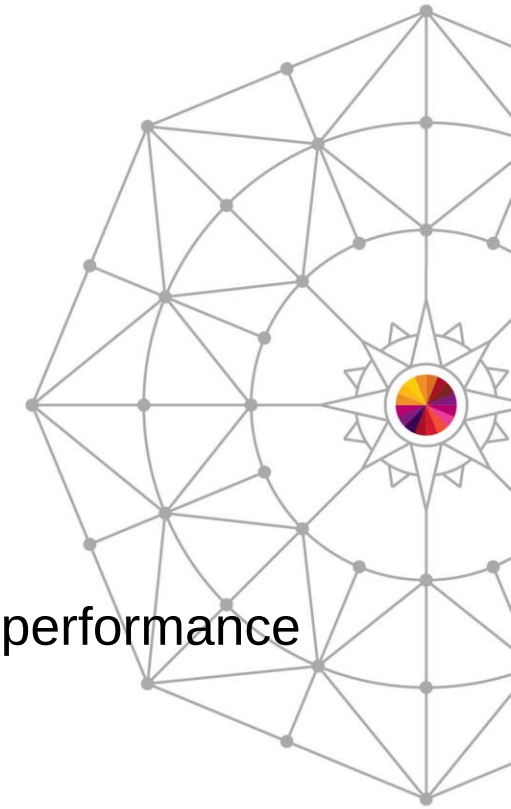
Total CPU – 1056 cores
Average consumption (CPU and Memory): 45%

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

Total monthly cost: US$ 50.349,60

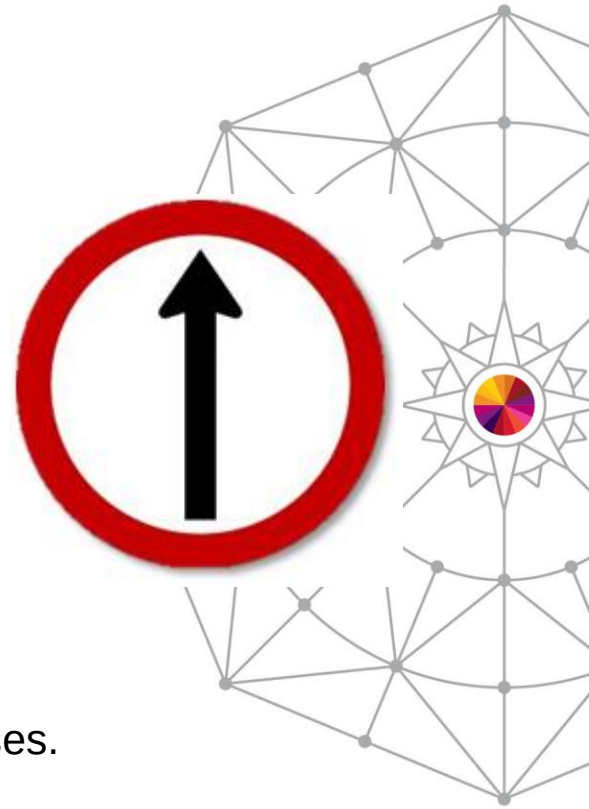
Difficulties and challenges

- 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;

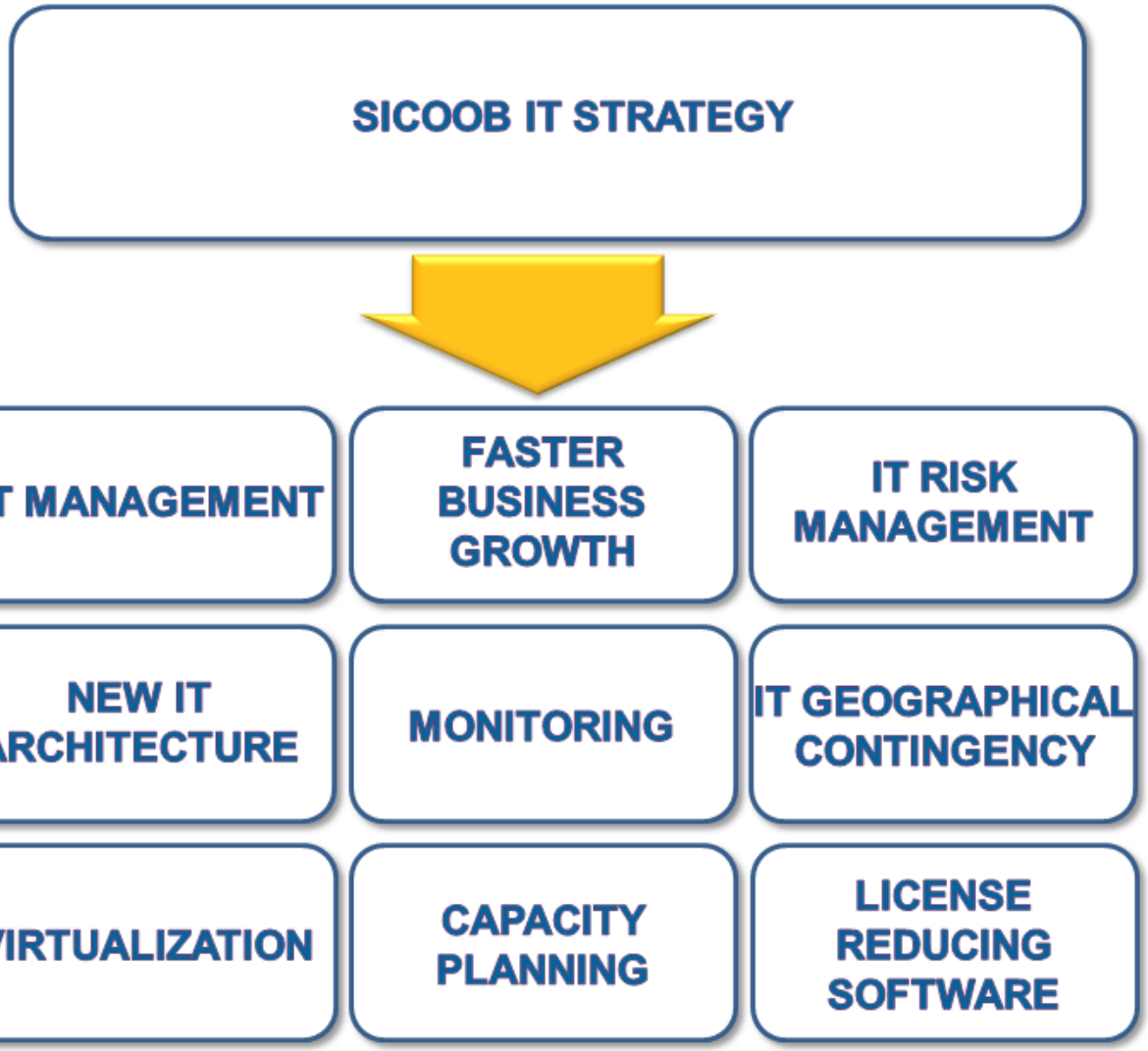


IT directions

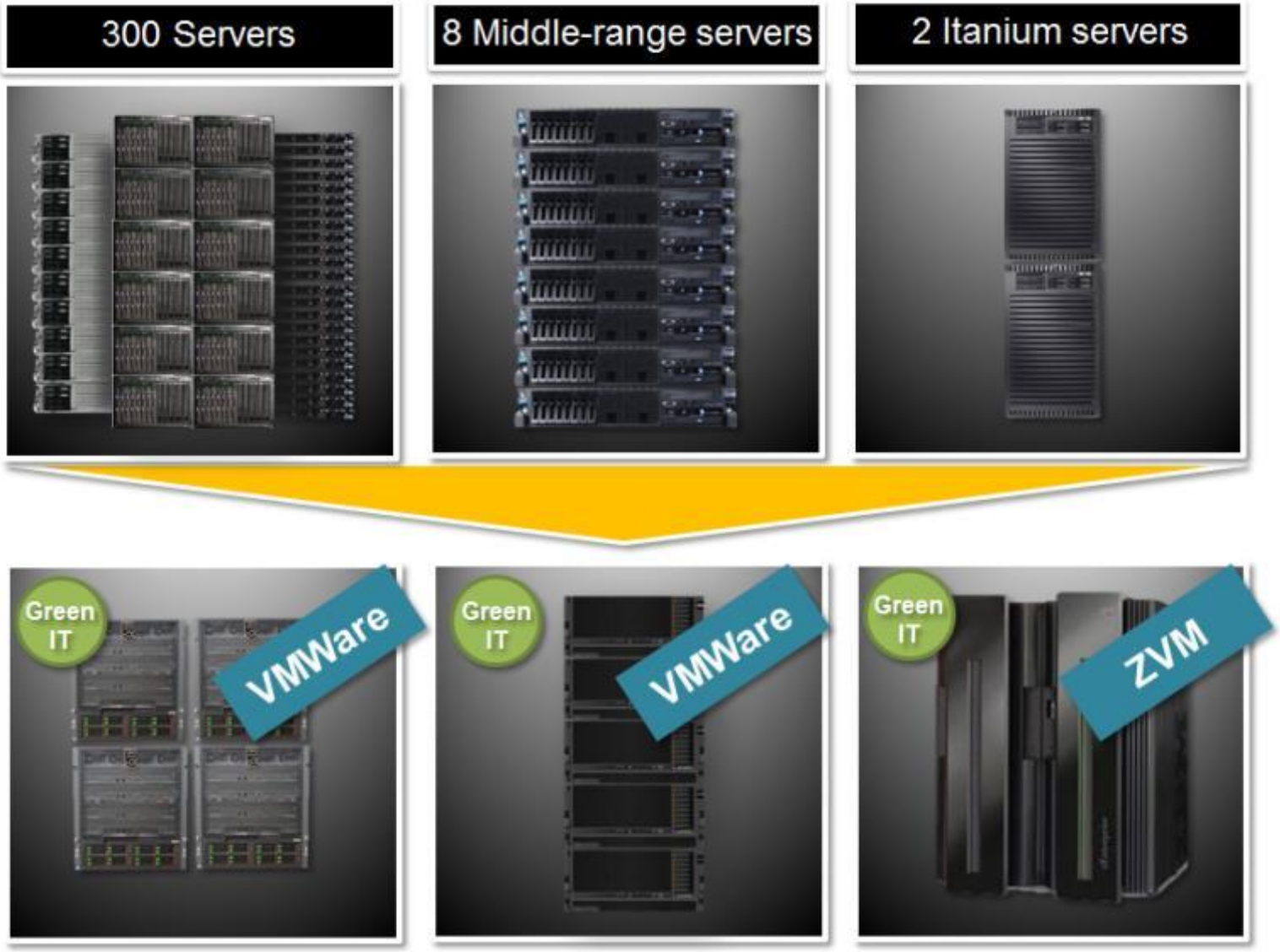
- Establishment of Committees and Political Groups;
- Technological guideline:
- Secure, available and updated solutions;
- Focus on business growth;
- Products and services monitoring;
- Quality control;
- Automation;
- Saving licensing;
- Social and environmental responsibilities.
- IT Strategic and Operational Planning;
- IT Process Control;
- Mapping and automating strategic and operational processes.



New IT directions



New replacement proposal



The New Systems Direction

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

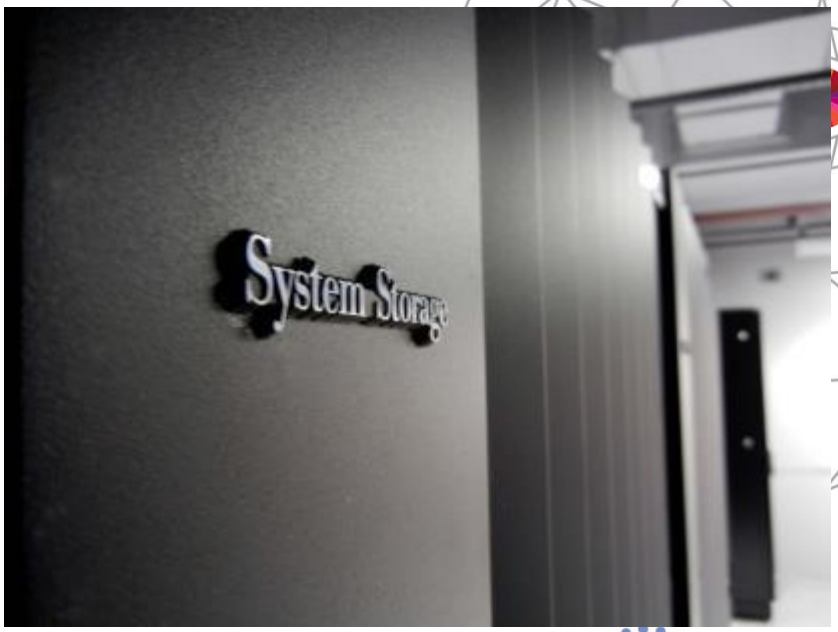
- Build a New Datacenter wich will come the Primary
- Starts the Geographical Contigency Project
- Preparing systems for Disaster Recovery
- Comply with Central Bank regulations
- Backup Library TS3500 upgraded
- More than 100 z/Linux guests

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: 768GB
LPAR: 4
Systems:
Banking Core
Application Servers
Data Banks

2013 Perspective – Resources Utilization

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	6 High end 605 servers	3 Mainframes 450 servers
		
Power Consumption – 18KWh Dissipation – 63.403BTUh Monthly Cost - US$ 3,500.00	Power Consumption – 48KWh Dissipation – 163.796BTUh Monthly Cost - US$ 9,300.00	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

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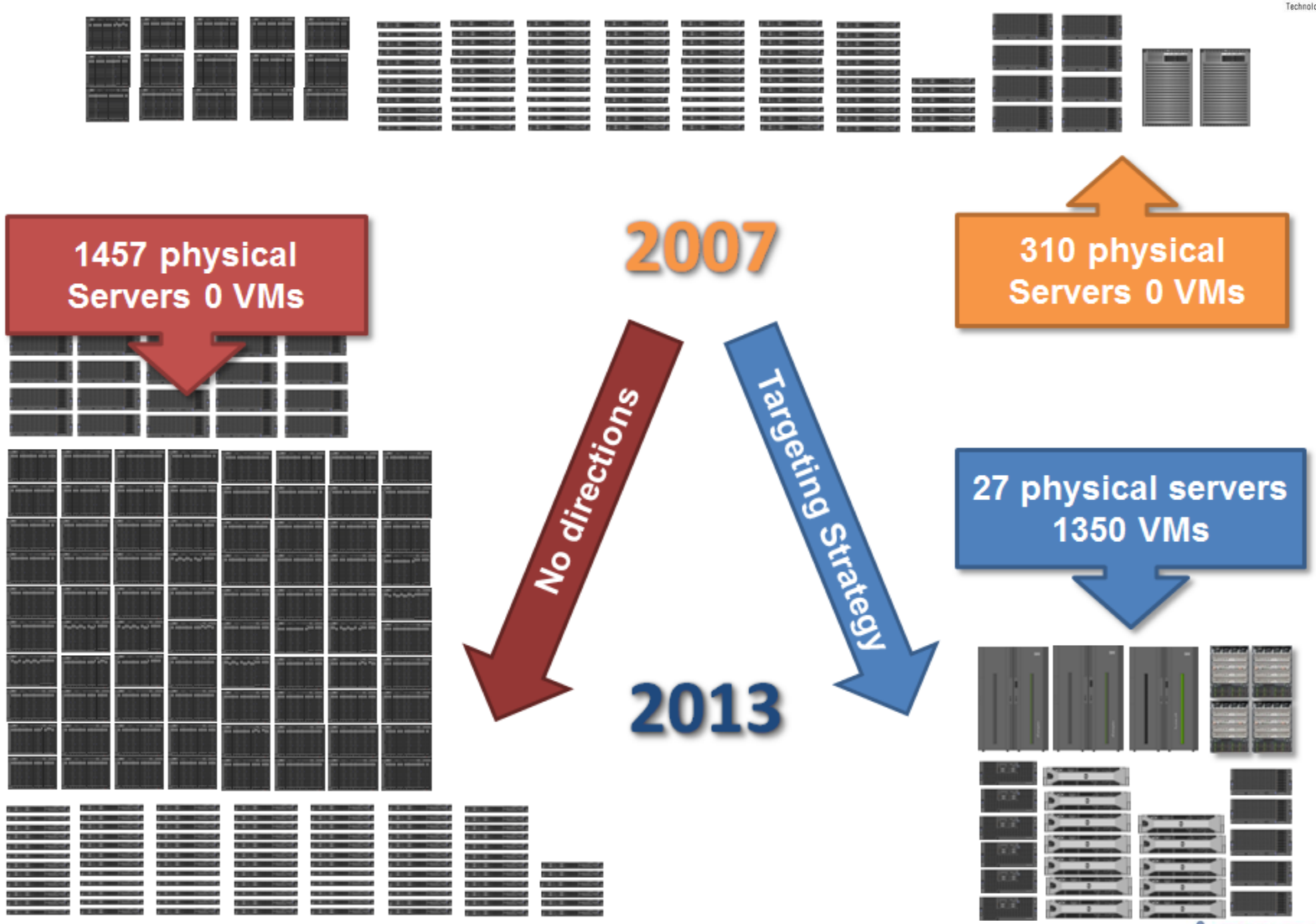
Strategic Comparison



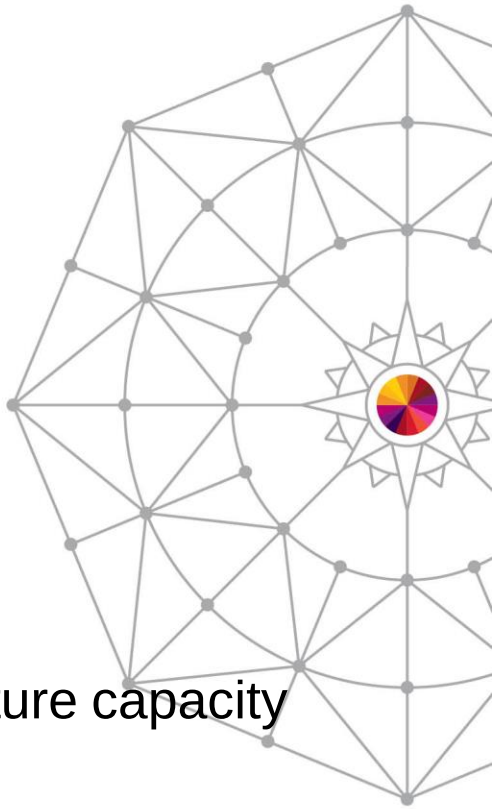
Financial Comparison

Costs	Current Scenario	Without Virtualization Scenario	Differential
Acquisition	US$ 16,150,000.00	US$ 15,200,000.00	+ 6,25%
Licensing	US$ 5,600,000.00	US$ 11,500,000.00	- 105%
Power Comsuption	US$ 257,500.00	US$ 2,800,000.00	- 987%
Management	US$ 1,065,000.00	US$ 2,130,000.00	- 100%
Additional Cost	-	US$ 4.100.000,00	-

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

Statistics

Power consumption saved per year

US$ 2,546,671

Sustainability

When the Sicoob´s equipments **were replaced,**

18,800,000 Kw/year of power **was saved** and

913 tons of CO_2/year **were not sent** into the atmosphere **This represents**

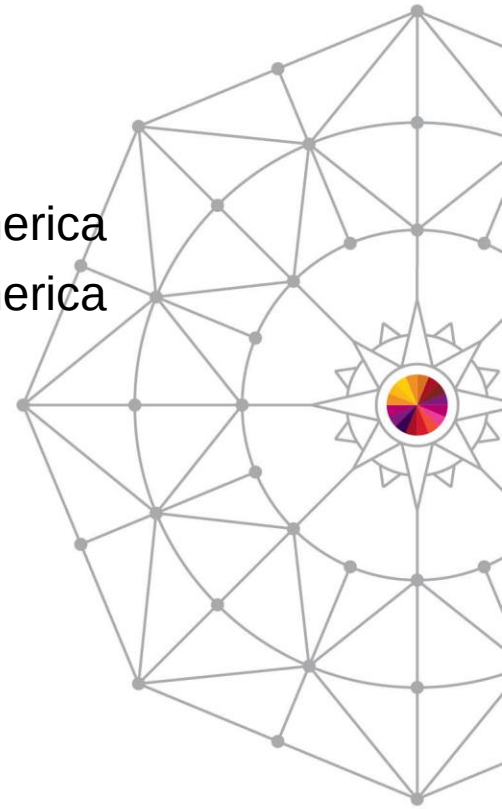
- Power Consumption of **6,000** houses/year

- **5,700** trees/year to replant

- **323** Cars emitting CO_2 /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 Brazi on 2 CECs

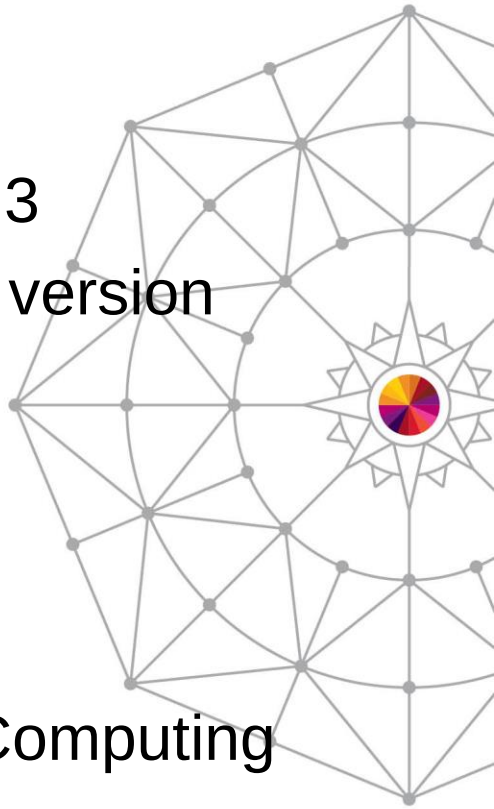


2013 Awards

GREAT PLACE TO WORK®

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 whith Cloud Computing Model
- Social Network, Mobility, Collaboration and SaaS



Thank You

SICOOB

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

Questions?