Capstone Project Presentation

Virtualization and Shared Infrastructure
Data Storage for IT in Kosovo institutions

November 14th, 2012
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The content of the Project

- ICT in Kosovo Institutions
- National Data Center
- Centralization of Data
- Shared infrastructure Data Storage
- Virtualization
- Disaster Recovery and Business Continuity
- Recommendations
The main goals of project

- Hardware Cost Savings/Reducing IT cost
- Increasing security
- Establishing of NDC
- Business Continuity
The benefits of project

- Optimizing usage of existing hardware resources
- Saving Datacenter Space
- Hardware maintenance
- Using shared infrastructure Data storage
- Reduced Energy consumption
ICT in Kosovo Institutions
DIT established in Institutions of Kosovo

- ICT Department (In accordance with Regulation No. 02/2011)
  - DeGAP/MPA
  - DIT/MIA
  - DIT/MED

- ICT Department (not in accordance with Regulation No. 02/2011)
  - DIT/MF
  - DIT/KTA
  - DIT/Costums
  - DIT/KCA
  - DIT/KP
Current Situation in MPA

- Most of IK using IT system administered by DeGAP/MPA.
- Decentralized Hardware Resources
- Administering over 800 devices
- Physical Machines
- Virtual Machines
- Shared Infrastructure Data storage
Virtualized Infrastructure in MPA
Web Hosting in Kosovo Institutions

Statistics in number  Statistics in percent

![Bar chart and pie chart showing statistics]

- CIHDeGAP: 38%
- KIHSE: 62%
- LIHDeGAP: 0%

8/1/2012
This project is dealing in detail with main issues:

- Building National Data Center;
- Virtualization;
- Integrated and Centralized of data;
- Business continuity
Project purpose of NDC

- To establish a shared, reliable, robust and secure infrastructure
- To facilitate consolidation of services
- To provide better operations/management control and to minimize overall cost of Data Management
- To have a scalable Data Center to provide continuous growth of e-government applications
- To ensure the smooth operation and maintenance of the application system
- To host high performance transactions, distribution, registry and other systems requiring high availability.
Virtualization Benefit

- Hardware Cost Savings
- Reduced Energy Consumption
- Disaster Recovery / Business Continuity
- Optimized usage of existing hardware resources
- Faster deployment of new logical servers
- Moving logical servers between hardware
- More flexible infrastructure
- Management
- Saving Datacenter Space
Virtualization in Kosovo Institutions

VMs and PMs in IK

Virtualization of servers in IK
Virtualization in MPA

VMs and PMs in IK

Virtualization of servers in MPA

VMs and PMs in MPA

[Pie charts showing percentages of virtualized servers and non-virtualized servers, as well as percentages of VMs and PMs.]

45% VMs
55% PMs
Recommendation 1

• Making the legal infrastructure for ICT, including establishment of bodies for ICT management under responsible of Kosovo Assembly and implementation of them.
Recommendation 2

Implementing a National Data Center

- Scalability
- Availability
- Interoperability
- Security
- Manageability
- Storage
Recommendation 3

Virtualization of hardware Resources in IT

Optimizing of resources use

What should be done in order to save IT costs:

- Virtualization of physical servers
- Virtualization of data storage
Reducing budget costs

The data output of this project capstone are made:

- **Average 3VMs per 1PMs**
- **Five years lifespan**

<table>
<thead>
<tr>
<th>Actual Situations</th>
<th>The percent of Servers virtualized</th>
<th>Reducing budget costs</th>
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<tbody>
<tr>
<td></td>
<td>15%</td>
<td>€55 thousand per year</td>
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<th>Continuing on the same level of virtualization</th>
<th>100%</th>
<th>€360 thousand per year</th>
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<th>Best practices - Recommended</th>
<th>100%</th>
<th>€720 thousand per year</th>
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Data output for cost savings

![Graph showing cost savings in € Million per year](image-url)
Recommendation 4

Data Centralization
Recommendation 5

- Building Disaster Recovery Center in the region of Peja for business continuity reason or
- Using Data center in Deqan, made by MIA and Financed by EU
Recommendation 6

- Linking Albania and Kosovo through optical fiber
- Making an agreement between governments of Kosovo and Albania
Linking Albania and Kosovo using FC

- The view of the network around Kosovo

  - Extended optic cable with a length of about 20 km depending on the route that extends cable
Thanks for your attention

Questions/Comments

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