MANAGEMENT OF WEB SERVERS
RESULTS OF THE CEO PROJECT

IBM RESEARCH
ZÜRICH
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Aiko Pras
CTIT
CENTRE FOR TELEMATICS AND INFORMATION TECHNOLOGY
UNIVERSITY OF TWENTE
THE NETHERLANDS

pras@cs.utwente.nl
http://www.cs.utwente.nl/~pras
http://wwwsnmp.cs.utwente.nl/
BACKGROUND

JOINT RESEARCH CENTRE (JRC)
  • EUROPEAN COMMISSION
  • ISPRA - ITALY

CENTRE FOR EARTH OBSERVATION (CEO)

PROVIDERS OF EARTH OBSERVATION DATA  USERS OF EARTH OBSERVATION DATA
BACKGROUND

INTERNET

PROVIDERS

WWW SERVER
WWW SERVER
WWW SERVER

USERS

WWW CLIENT
WWW CLIENT
WWW CLIENT
WWW CLIENT
WWW CLIENT
WWW CLIENT
PROOF OF CONCEPT

WWW MANAGEMENT:
• DESIGN AND DEMONSTRATION
• FIRST PROJECT OF A SERIE

PARTNERS:
• ESYS LTD. - GUILDFORD, UK
  • CTIT - UT, NL
  • 9 MONTHS - 120.000 ECU

WORK DIVISION:
• ARCHITECTURE: ESYS & CTIT
  • MANAGER: ESYS
  • AGENT: CTIT
APPROACH
APPROACH

WWW server

S-MIB

S-MIB

S-MIB
APPROACH
Document transfer service

H-MIB

H-MIB

H-MIB

H-MIB

H-MIB

H-MIB

H-MIB

H-MIB

H-MIB

H-MIB
S-MIB

GENERAL  ACCESS  DOCUMENT  ERROR
A-MIB

client side

request

A-MIB

/server side

'HTTP service'

indication

response

confirm

A-MIB

A-MIB
HTTP-MIB

TRAFFIC PATTERN:
- # REQUESTS
- # INDICATIONS
- # RESPONSES
- # CONFIRMS

QUALITY OF SERVICE:
- DELAY PER DESTINATION
- THROUGHPUT PER DESTINATION
  - # TIME-OUTS
  - # ERRORS
OTHER-MIBS

HTTP-MIB

S-MIB

A-MIB

HTTP

TCP

IP

MIB-II

LINK

LINK

WWW-SERVER SYSTEM
AGENT IMPLEMENTATION

WWW-SERVER SYSTEM

- SERVER PROCES
  - HTML FILES
  - HTTP

- UNIX KERNEL
  - TCP
  - IP
  - LINK

- LOG FILES

- MASTER AGENT

- SUBAGENT
  - S
  - HTTP

- SUBAGENT
  - A

- SUBAGENT
  - MIB-II

- SUBAGENT
  - LINK

MANAGER SYSTEM

SNMP
SUBAGENT IMPLEMENTATION

ACCESS LOGFILE

ERROR LOGFILE

TAIL

SCAN ACCESS LINE

SCAN ERROR LINE

COMPUTATION

S

A

HTTP

LOG INFO

LOG INFO BY LINES

LOG INFO BY ELEMENTS
# LOGFILES VERSUS IPC

<table>
<thead>
<tr>
<th>METHOD</th>
<th>ADVANTAGE</th>
<th>DISADVANTAGE</th>
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<tbody>
<tr>
<td>IPC APPROACH</td>
<td>• COMPLETE CONTROL OVER SERVER (SET OPERATIONS ARE POSSIBLE)</td>
<td>• SERVER SOFTWARE NEED TO BE MODIFIED</td>
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<tr>
<td>LOGFILE APPROACH</td>
<td>• NO NEED TO MODIFY SERVER SOFTWARE</td>
<td>• SERVER CAN ONLY BE MONITORED (SET OPERATIONS ARE NOT POSSIBLE)</td>
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<td>• CAN BE USED WITH DIFFERENT SERVERS</td>
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RESULTS

- AGENT HAS BEEN DEMONSTRATED SUCCESSFULLY
- FIRST SNMP BASED WWW-MANAGEMENT SYSTEM IN THE WORLD
  - STANDARDIZATION WITHIN IETF
  - RELATION WITH APPLICATION MIB
    - FOLLOW-UP CONTRACT?
    - NWO - SION?