

# Eclipse DemoCamps,

November 2008, Sofia

## Get Connected and Distributed

Internet Enabled Systems

New dimensions of scalability

Christo Radev and Mladen Nochev, November 2008, Plovdiv

# Get Connected and Distributed

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## Contemporary system main features

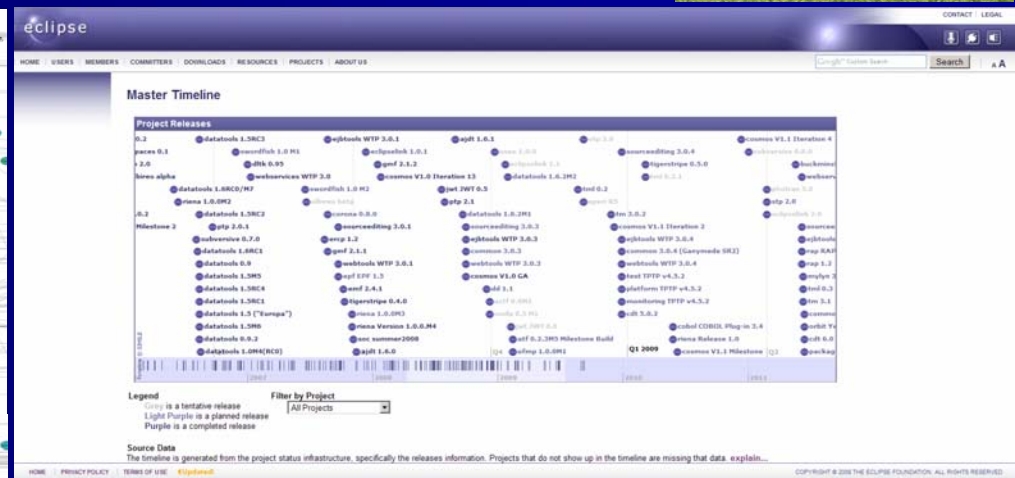
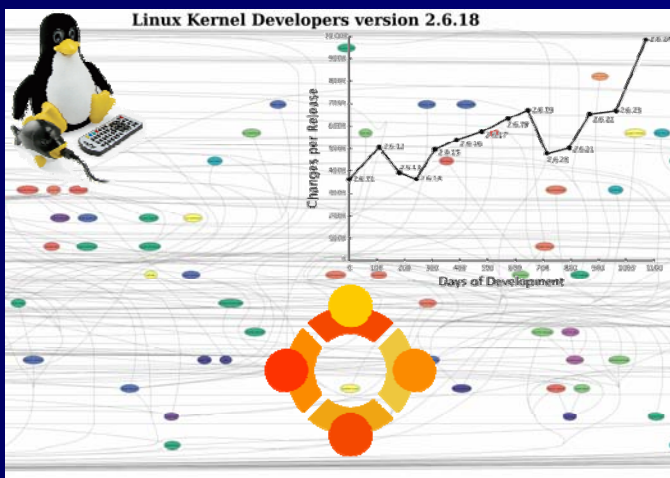
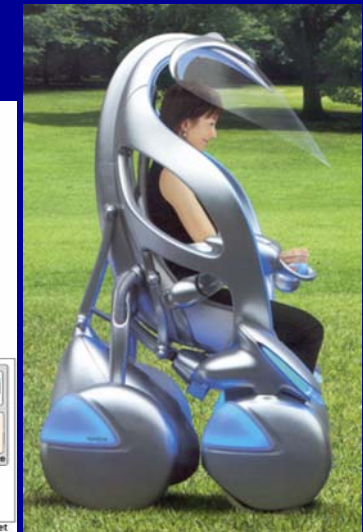
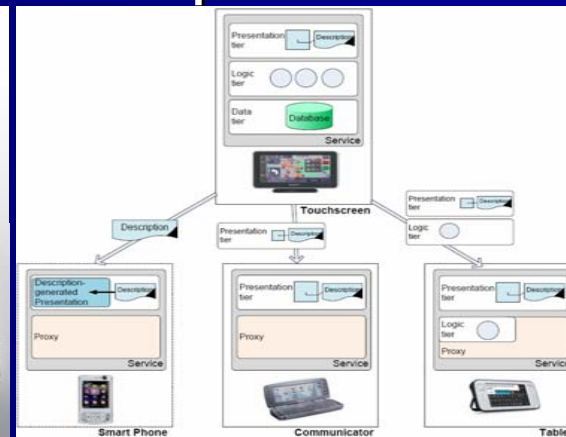
- Internet enablement
- Scalability and reliability
- Connectivity and availability
- Maintainability and flexibility
- Collaboration based on openness
- Manufacturer neutrality and compatibility
- Platform independency and portability

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## Spots of the Openness



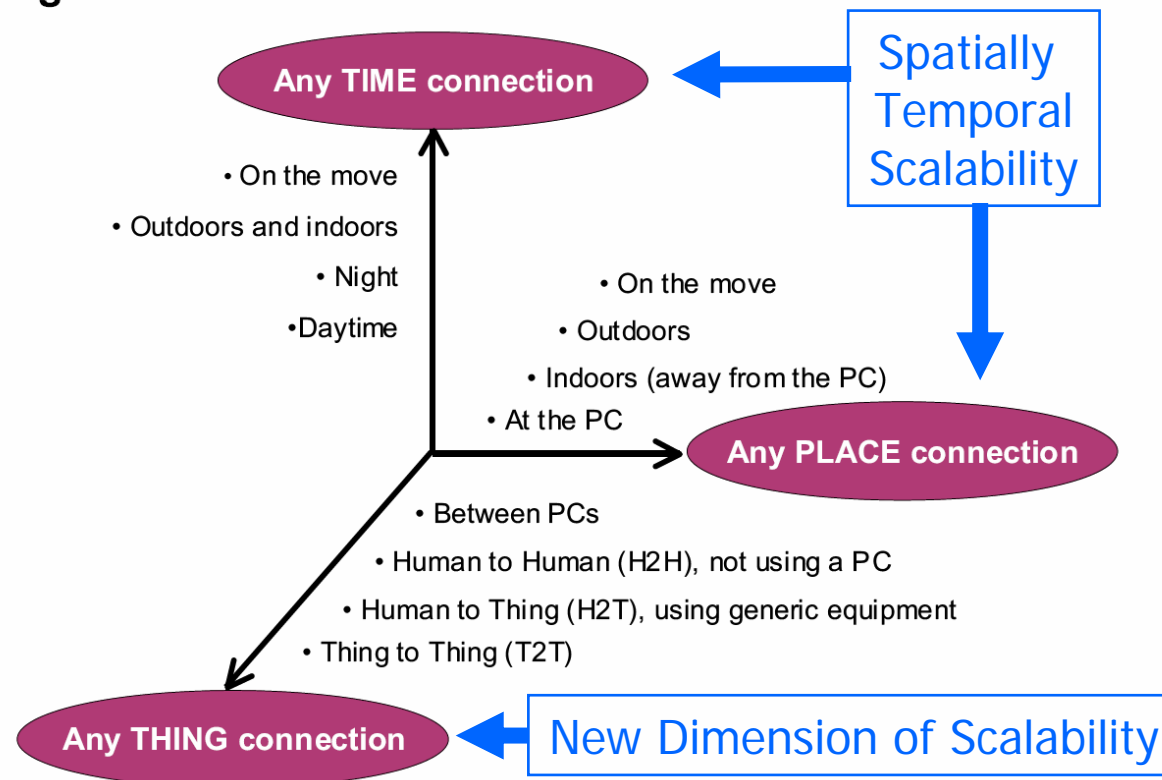
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## Internet of Things

Figure 1 – A new dimension



Source: ITU adapted from Nomura Research Institute

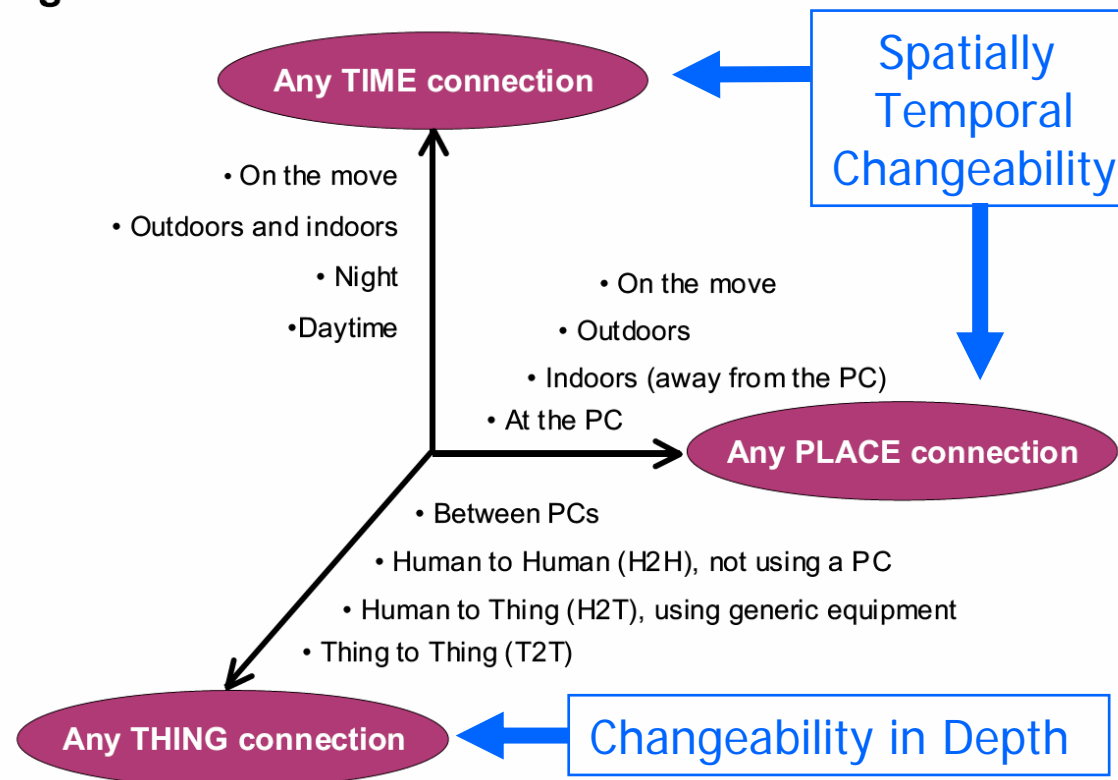
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## Things with Lifestyle

Figure 1 – A new dimension



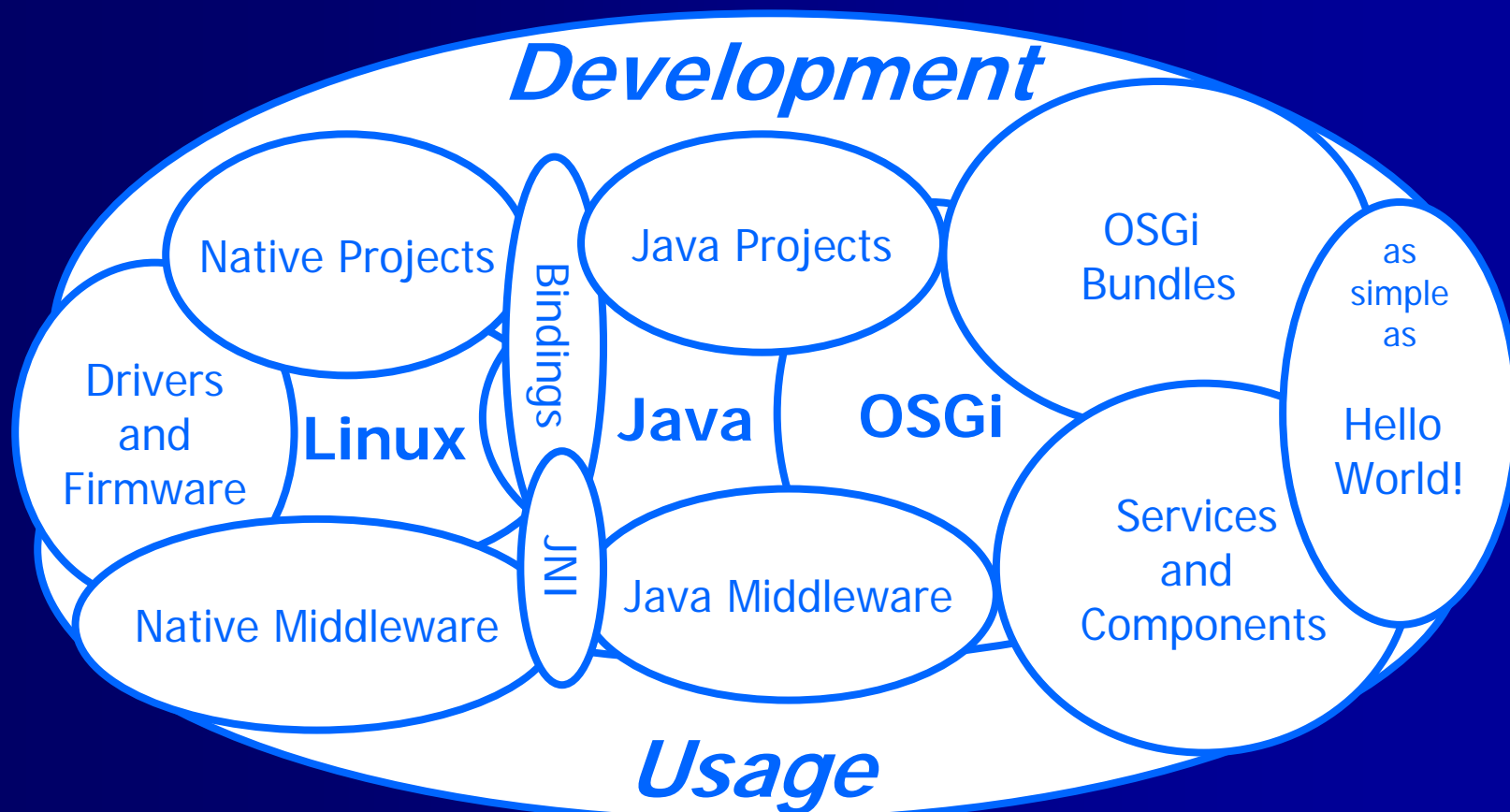
Source: ITU adapted from Nomura Research Institute

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“Technology jam” or “a gem of a child”



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Proof of concept usecase

- Security domain targeted,
- Audio, video and event based,
- Internet enabled, Distributed,
- Simple and flexible at installation,
- Automated and remotely maintainable
- AV Surveillance for Security Systems with
- 3 Dimensional changeability and
- 100% Open Source and Standards basis

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Tested, Currently Used, Planned for Usage

- OS – Linux, MacOS, Windows etc.
- Java – OpenJDK, JamVM, Sun JDK etc.
- OSGi - Equinox, RCP, RAP, ECF etc.
- Projects – R-OSGi, BarkIDS, eConference,
- VideoLAN's VLC Media Player, JVLC etc.
- Fluent interface, Dependency Injection,
- Inversion of Control, Aspects etc.



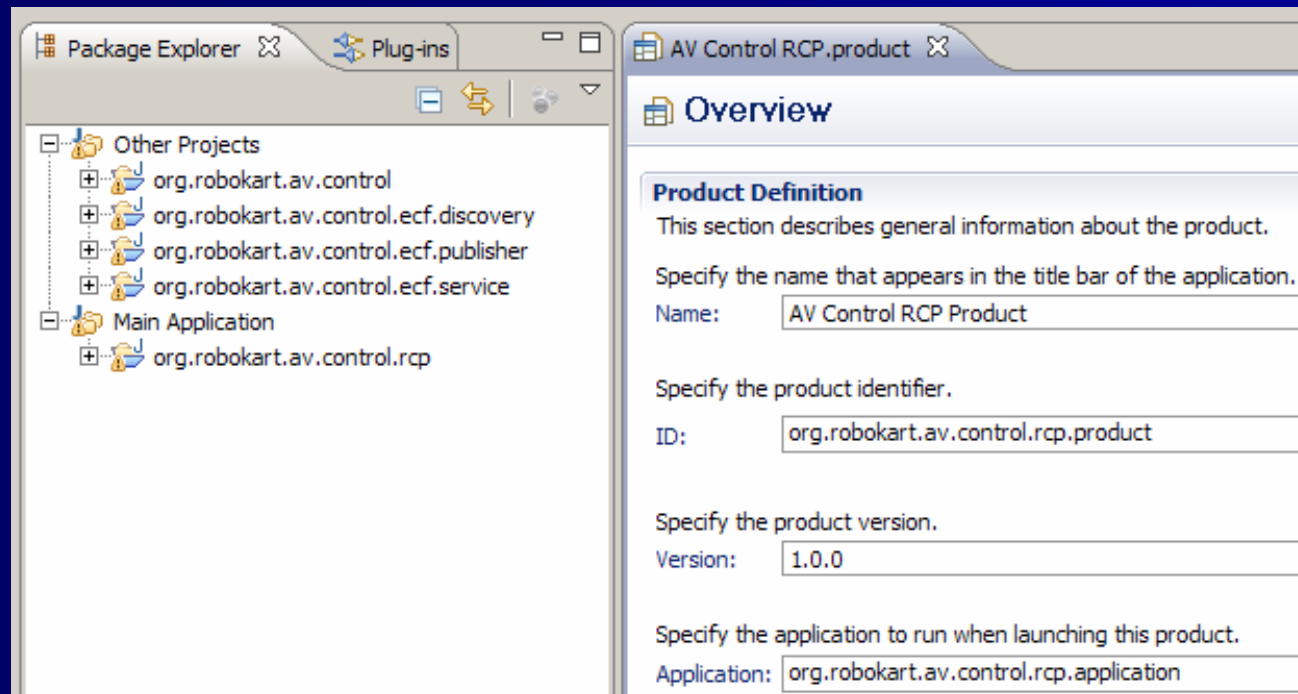
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## Demo Implementation – RCP Application

- Incorporated Simulator of PTZ Cameras and
- End User Desktop Application

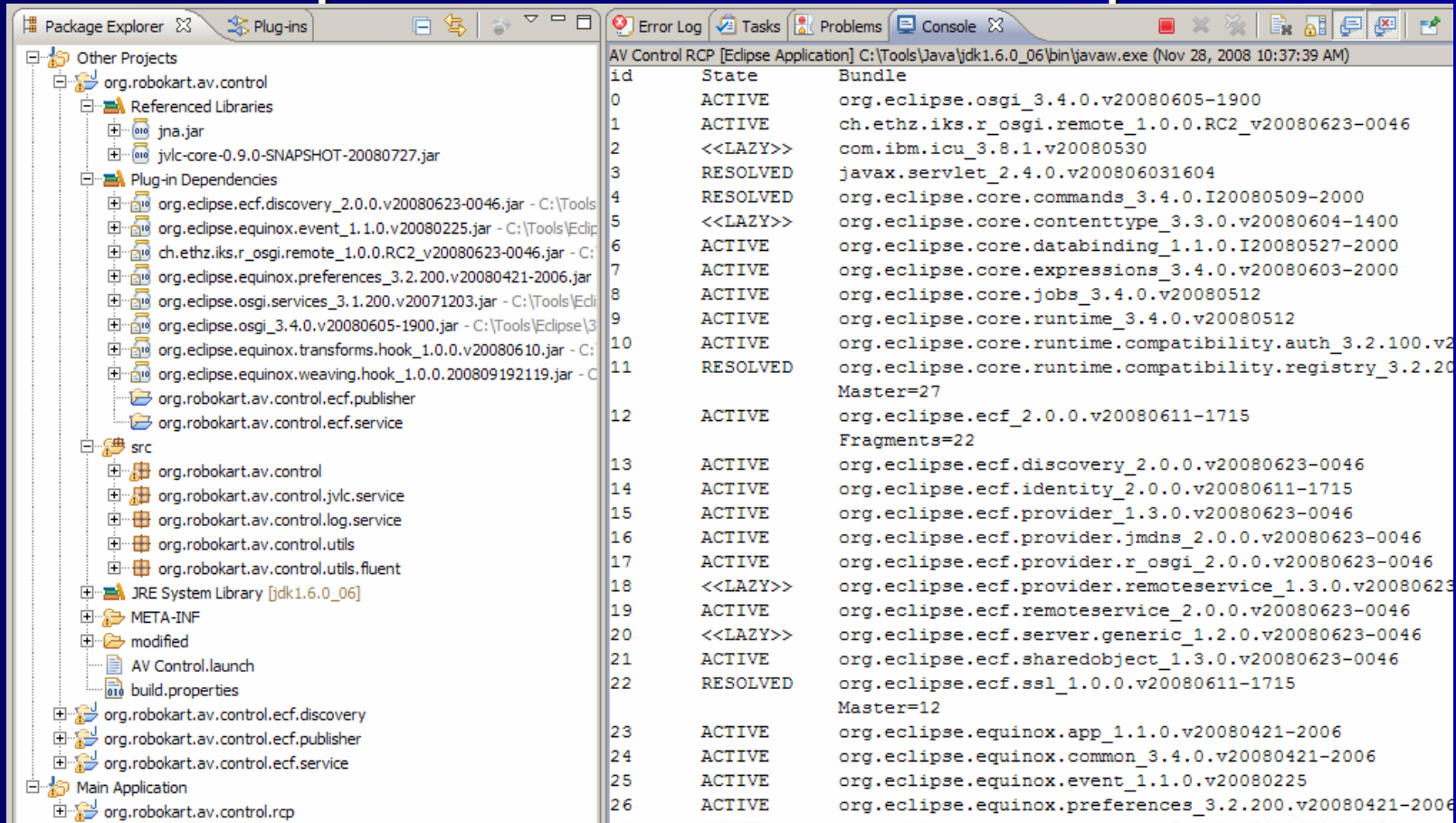


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## Demo Implementation – RCP Dependencies



The screenshot displays the Eclipse IDE interface. The Package Explorer on the left shows the project structure for 'org.robokart.av.control'. It includes 'Referenced Libraries' (jna.jar, jvlc-core-0.9.0-SNAPSHOT-20080727.jar), 'Plug-in Dependencies' (org.eclipse.ecf.discovery\_2.0.0.v20080623-0046.jar, org.eclipse.equinox.event\_1.1.0.v20080225.jar, ch.ethz.iks.r\_osgi.remote\_1.0.0.RC2\_v20080623-0046.jar, org.eclipse.equinox.preferences\_3.2.200.v20080421-2006.jar, org.eclipse.osgi.services\_3.1.200.v20071203.jar, org.eclipse.osgi\_3.4.0.v20080605-1900.jar, org.eclipse.equinox.transforms.hook\_1.0.0.v20080610.jar, org.eclipse.equinox.weaving.hook\_1.0.0.200809192119.jar, org.robokart.av.control.ecf.publisher, org.robokart.av.control.ecf.service), 'src' (org.robokart.av.control, org.robokart.av.control.jvlc.service, org.robokart.av.control.log.service, org.robokart.av.control.utils, org.robokart.av.control.utils.fluent), 'META-INF' (JRE System Library [jdk1.6.0\_06], modified), and 'Main Application' (AV Control.launch, build.properties). The Console window on the right shows the 'AV Control RCP' application log, listing various bundles and their states (ACTIVE, RESOLVED, <<LAZY>>).

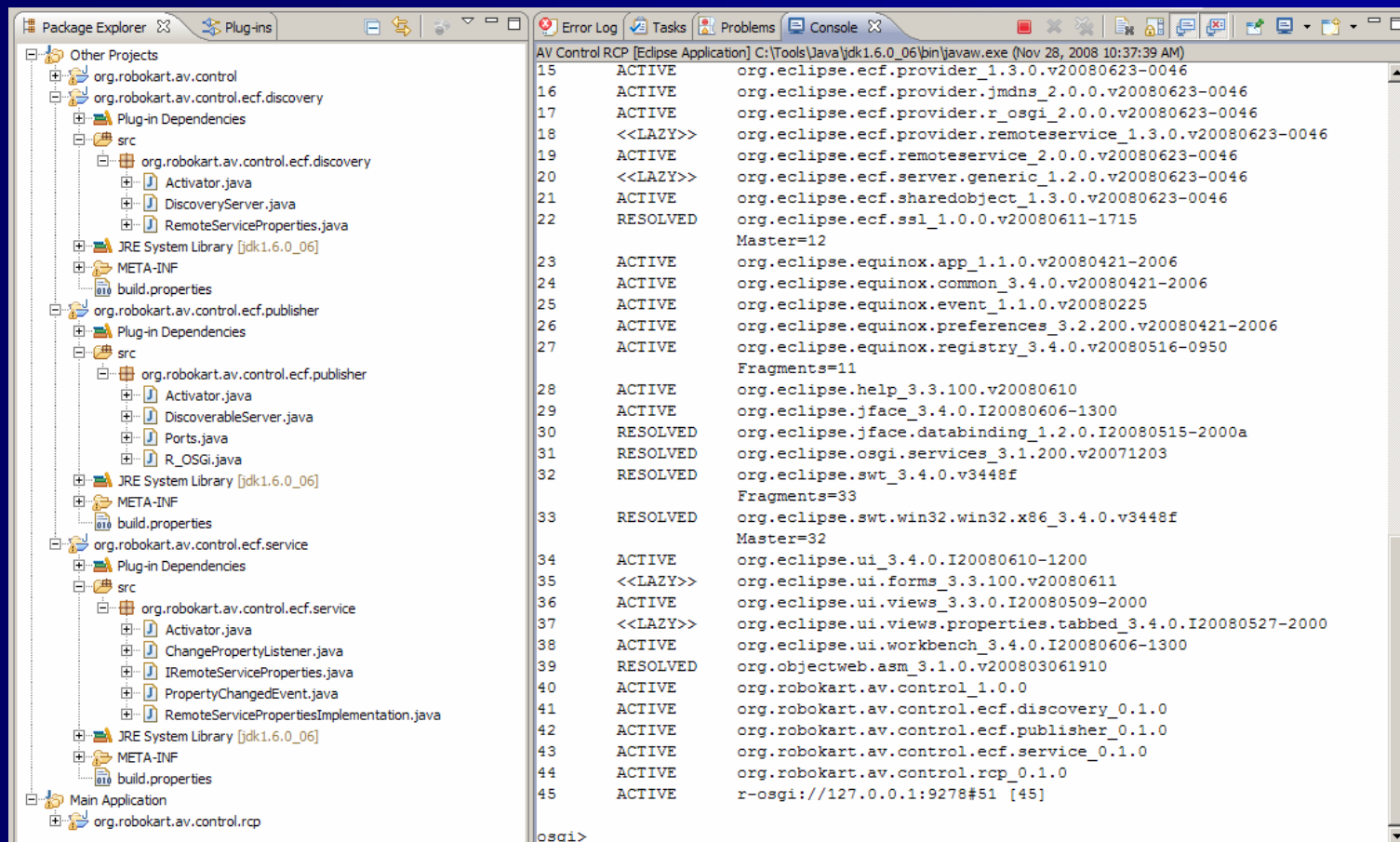
id	State	Bundle
0	ACTIVE	org.eclipse.osgi_3.4.0.v20080605-1900
1	ACTIVE	ch.ethz.iks.r_osgi.remote_1.0.0.RC2_v20080623-0046
2	<<LAZY>>	com.ibm.icu_3.8.1.v20080530
3	RESOLVED	javax.servlet_2.4.0.v200806031604
4	RESOLVED	org.eclipse.core.commands_3.4.0.I20080509-2000
5	<<LAZY>>	org.eclipse.core.contenttype_3.3.0.v20080604-1400
6	ACTIVE	org.eclipse.core.databinding_1.1.0.I20080527-2000
7	ACTIVE	org.eclipse.core.expressions_3.4.0.v20080603-2000
8	ACTIVE	org.eclipse.core.jobs_3.4.0.v20080512
9	ACTIVE	org.eclipse.core.runtime_3.4.0.v20080512
10	ACTIVE	org.eclipse.core.runtime.compatibility.auth_3.2.100.v20080512
11	RESOLVED	org.eclipse.core.runtime.compatibility.registry_3.2.20080512
12	ACTIVE	org.eclipse.ecf_2.0.0.v20080611-1715
13	ACTIVE	org.eclipse.ecf.discovery_2.0.0.v20080623-0046
14	ACTIVE	org.eclipse.ecf.identity_2.0.0.v20080611-1715
15	ACTIVE	org.eclipse.ecf.provider_1.3.0.v20080623-0046
16	ACTIVE	org.eclipse.ecf.provider.jmdns_2.0.0.v20080623-0046
17	ACTIVE	org.eclipse.ecf.provider.r_osgi_2.0.0.v20080623-0046
18	<<LAZY>>	org.eclipse.ecf.provider.remoteservice_1.3.0.v20080623-0046
19	ACTIVE	org.eclipse.ecf.remoteservice_2.0.0.v20080623-0046
20	<<LAZY>>	org.eclipse.ecf.server.generic_1.2.0.v20080623-0046
21	ACTIVE	org.eclipse.ecf.sharedobject_1.3.0.v20080623-0046
22	RESOLVED	org.eclipse.ecf.ssl_1.0.0.v20080611-1715
23	ACTIVE	org.eclipse.equinox.app_1.1.0.v20080421-2006
24	ACTIVE	org.eclipse.equinox.common_3.4.0.v20080421-2006
25	ACTIVE	org.eclipse.equinox.event_1.1.0.v20080225
26	ACTIVE	org.eclipse.equinox.preferences_3.2.200.v20080421-2006
27	ACTIVE	org.eclipse.equinox.preferences_3.2.200.v20080421-2006

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## Shared Staff – Communication



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## Shared Staff – Audio, Video and PTZ Control

Package Explorer

- Other Projects
  - org.robokart.av.control
    - Referenced Libraries
    - Plug-in Dependencies
    - src
      - org.robokart.av.control
        - org.robokart.av.control.jvlc.service
          - AVCMCommand.java
          - AVCMDestination.java
          - AVCMedia.java
          - AVCMPPoint.java
          - AVCMPtz.java
          - AVControl.java
          - AVDefault.java
          - ChangeAVCMediaEvent.java
          - ChangeAVCMediaListener.java
          - ChangeCameraPtzEvent.java
          - ChangeCameraPtzListener.java
          - JvlcService.java
          - JvlcServiceImpl.java
          - TestStream.java
        - org.robokart.av.control.log.service
        - org.robokart.av.control.utils
        - org.robokart.av.control.utils.fluent
      - JRE System Library [jdk1.6.0\_06]
      - META-INF
      - modified
      - AV Control.launch
      - build.properties
    - org.robokart.av.control.ecf.discovery
    - org.robokart.av.control.ecf.publisher
    - org.robokart.av.control.ecf.service
  - Main Application
    - org.robokart.av.control.rcp

Console

```
AV Control RCP [Eclipse Application] C:\Tools\Java\jdk1.6.0_06\bin\javaw.exe (Nov 28, 2008 10:37:39 AM)

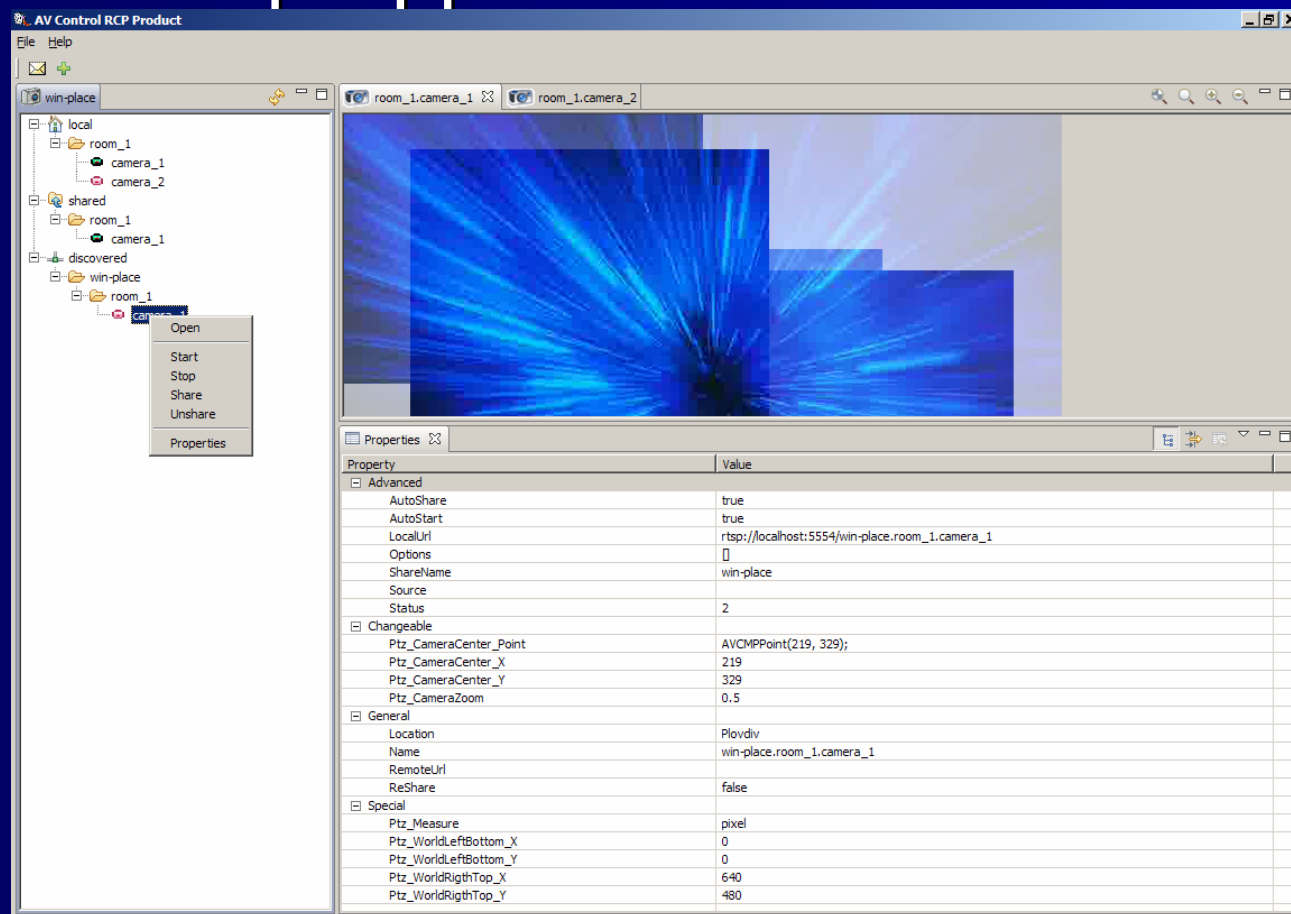
osgi> org.eclipse.equinox.event is starting ...
org.robokart.av.control.service is starting ...
org.robokart.av.control.service registers: av.control.type=jvlc
org.robokart.av.control.jvlc.service is starting ...
org.robokart.av.control.ecf.service is starting ...
[00000001] main libvlc debug: VLC media player - version 0.9.4 Grishenko - (c) 1996-2008 the VideoL
[00000001] main libvlc debug: libvlc was configured with ./configure '--host=i586-mingw32msvc' '--
[00000001] main libvlc debug: translation test: code is "C"
[00000368] main interface: creating httpd
org.robokart.av.control.ecf.publisher is starting ...
org.robokart.av.control.ecf.publisher registers: av.control.type=ecfp
Start publishing of camera win-place.room_1.camera_1
Registered remote service org.robokart.av.control.ecf.service.IRemoteServiceProperties with org.ec
Camera Properties : {Ptz_CameraCenter_X=320, Ptz_WorldLeftBottom_X=0, Ptz_CameraCenter_Po
Send : Initialize
Return : STATUS : OK
service published for discovery
    serviceName=win-place.room_1.camera_1
    serviceTypeID=ServiceTypeID[typeName=PublishedCameras_tcp.local.IANA]
    serviceProperties={cls=org.robokart.av.control.ecf.service.IRemoteServiceProperties, cns=o
[mjpeg @ 04B31BA0]removing common factors from framerate
[mjpeg @ 04B31BA0]removing common factors from framerate
libdvbpsi error (PSI decoder): TS discontinuity (received 15, expected 0) for PID 0
libdvbpsi error (PSI decoder): TS discontinuity (received 15, expected 0) for PID 66
[00000425] main packetizer error: object is not attached
[00000424] main demux error: object is not attached
[00000418] main access error: object is not attached
[00000415] main stream output error: object is not attached
org.robokart.av.control.ecf.discovery is starting ...
Ecf Discovery - addServiceInfo() - Properties::name: win-place.room_1.camera_1
Ecf Discovery - getServiceProperties() - Properties::name: {Ptz_WorldLeftBottom_X=0, Ptz_CameraCen
AVCMPPoint(320, 240);
```

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## Desktop Application– RCP User Interface





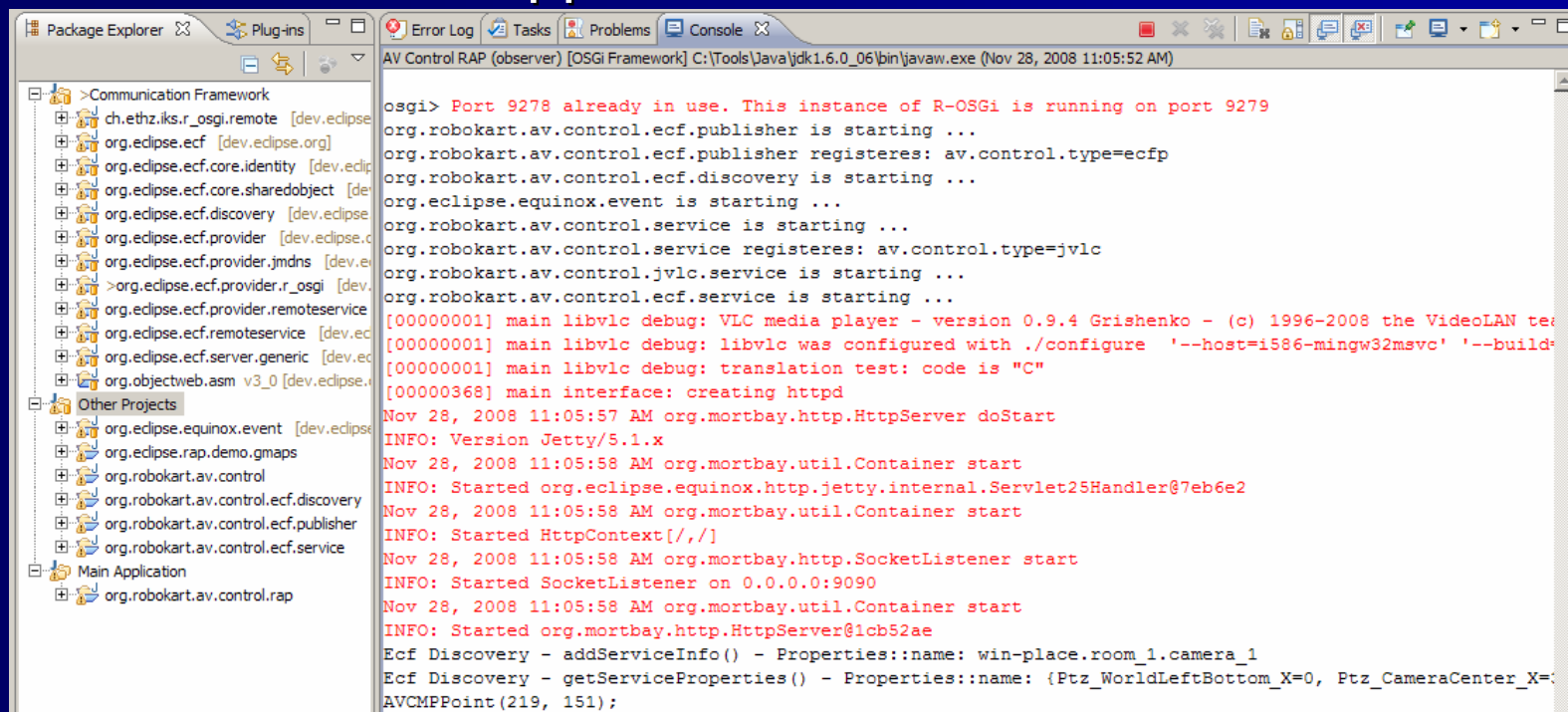
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## Demo Implementation – RAP Application

- Incorporated Simulator of PTZ Cameras and
- End User Web Application



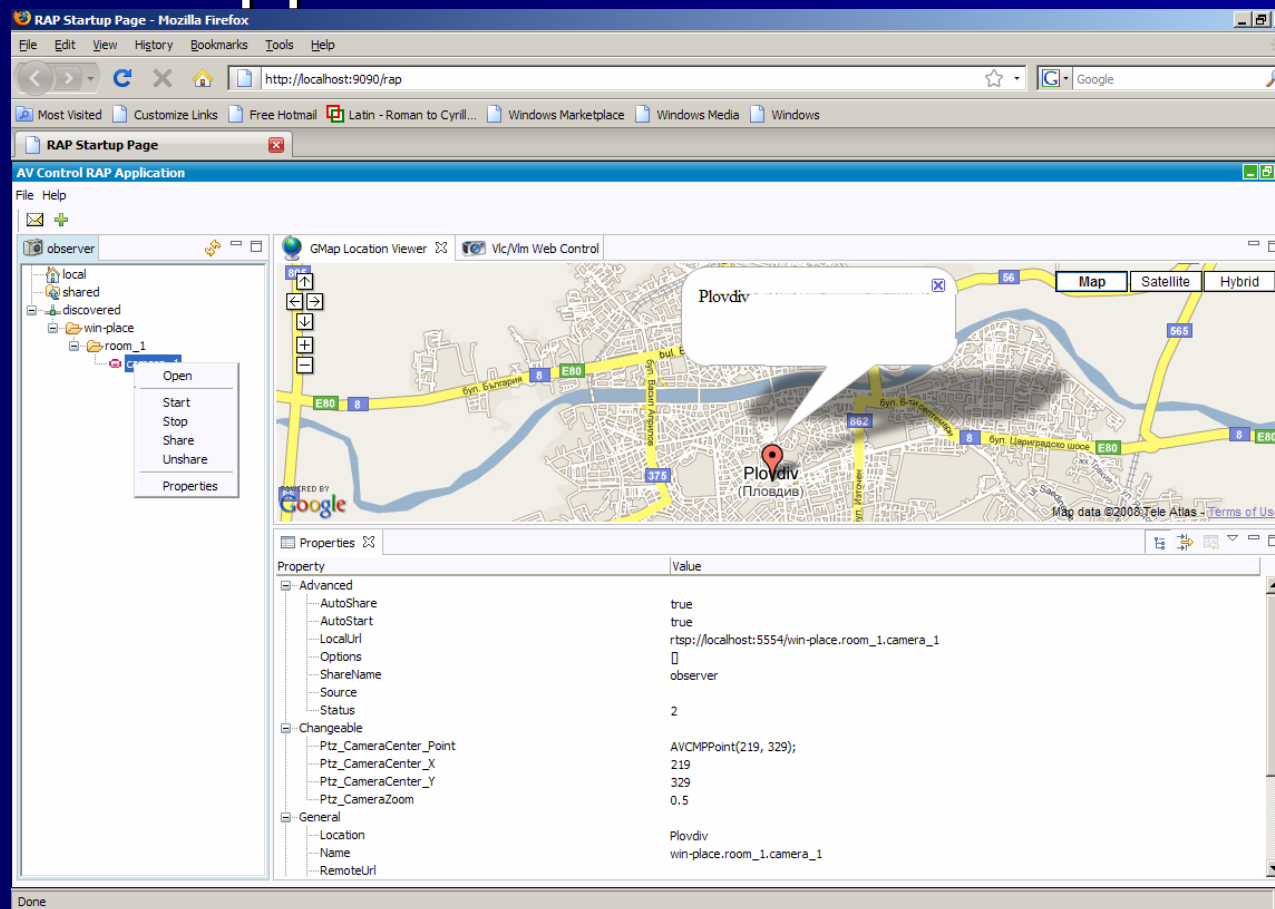
```
osgi> Port 9278 already in use. This instance of R-OSGi is running on port 9279
org.robokart.av.control.ecf.publisher is starting ...
org.robokart.av.control.ecf.publisher registeres: av.control.type=ecfp
org.robokart.av.control.ecf.discovery is starting ...
org.eclipse.equinox.event is starting ...
org.robokart.av.control.service is starting ...
org.robokart.av.control.service registeres: av.control.type=jvlc
org.robokart.av.control.jvlc.service is starting ...
org.robokart.av.control.ecf.service is starting ...
[00000001] main libvlc debug: VLC media player - version 0.9.4 Grishenko - (c) 1996-2008 the VideoLAN te
[00000001] main libvlc debug: libvlc was configured with ./configure '--host=i586-mingw32msvc' '--build=
[00000001] main libvlc debug: translation test: code is "C"
[00000368] main interface: creating httpd
Nov 28, 2008 11:05:57 AM org.mortbay.http.HttpServer doStart
INFO: Version Jetty/5.1.x
Nov 28, 2008 11:05:58 AM org.mortbay.util.Container start
INFO: Started org.eclipse.equinox.http.jetty.internal.Servlet25Handler@7eb6e2
Nov 28, 2008 11:05:58 AM org.mortbay.util.Container start
INFO: Started HttpContext[/,/]
Nov 28, 2008 11:05:58 AM org.mortbay.http.SocketListener start
INFO: Started SocketListener on 0.0.0.0:9090
Nov 28, 2008 11:05:58 AM org.mortbay.util.Container start
INFO: Started org.mortbay.http.HttpServer@1cb52ae
Ecf Discovery - addServiceInfo() - Properties::name: win-place.room_1.camera_1
Ecf Discovery - getServiceProperties() - Properties::name: {Ptz_WorldLeftBottom_X=0, Ptz_CameraCenter_X=
AVCMPPPoint(219, 151);
```

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## RAP Application – Web User Interface

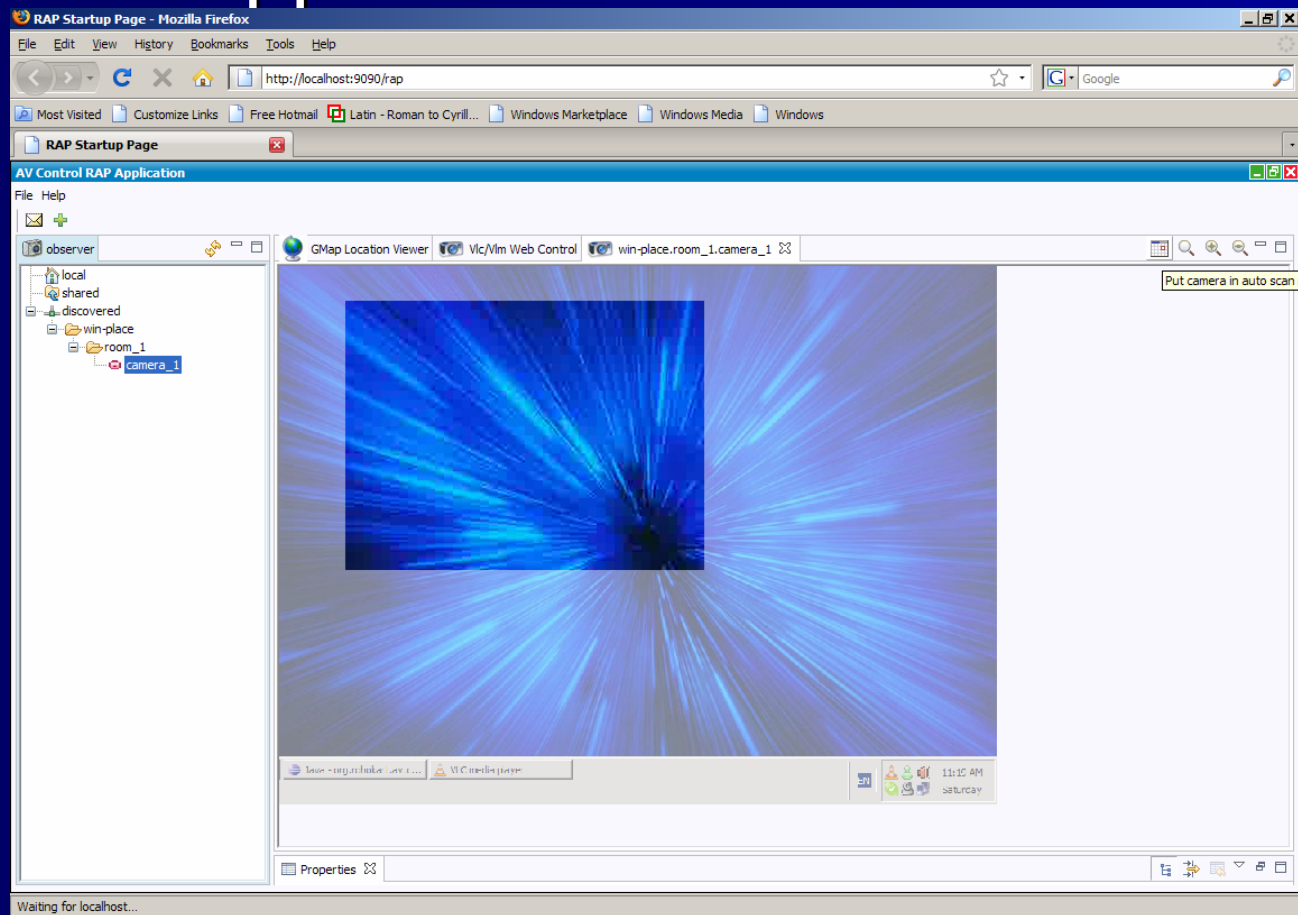


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## RAP Application – Video Control Interface





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## RAP and RCP Applications – running staff

```
C:\Documents and Settings\Administrator\Desktop\2008-05\stwork\Demo\2008-11-11
z.CameraCenter_Point=AUCMPPoint(320, 240);, Location=Plovdiv, Ptz_Cam
5, ReShare=false, Name=room_1.camera_1, Ptz_WorldRigthTop_X=640, Ptz_
op_V=480, RemoteUrl=rtsp://localhost:5554/win-place.room_1.camera_1,
=pxie1)
AUCMPPoint(320, 240);

osgi> ss

Framework is launched.

id      State      Bundle
0       ACTIVE    org.eclipse.osgi_3.4.0.v20080605-1900
1       ACTIVE    ch.ethz.iks.r.osgi.remote_1.0.0.RC2_200811271358
2       ACTIVE    com.ibm.icu_3.8.1.v20080530
3       ACTIVE    javax.servlet_2.4.0.v200806031604
4       ACTIVE    org.eclipse.commons.logging_1.0.4.v20080605-1930
5       ACTIVE    org.eclipse.core.commands_3.4.0.I20080509-2000
6       ACTIVE    org.eclipse.core.contenttype_3.3.0.v20080604-1400
7       ACTIVE    org.eclipse.core.databinding_1.1.0.I20080527-2000
8       ACTIVE    org.eclipse.core.expressions_3.4.0.v20080603-2000
9       ACTIVE    org.eclipse.core.jobs_3.4.0.v20080512
10      ACTIVE    org.eclipse.core.runtime_3.4.0.v20080512
11      RESOLVED  org.eclipse.core.runtime.compatibility.auth_3.2.1
12      ACTIVE    org.eclipse.core.runtime.compatibility.registry_3
13      ACTIVE    Master=27
14      ACTIVE    org.eclipse.ecf_2.0.0.v20080611-1715
15      ACTIVE    Fragments=22
16      ACTIVE    org.eclipse.ecf.discovery_2.0.0.v20080623-0046
17      ACTIVE    org.eclipse.ecf.identity_2.0.0.v20080611-1715
18      ACTIVE    org.eclipse.ecf.provider_1.3.0.v20080623-0046
19      ACTIVE    org.eclipse.ecf.provider.jndns_2.0.0.v20080623-00
20      ACTIVE    org.eclipse.ecf.provider.r.osgi_2.0.0.v20080623-0
21      ACTIVE    org.eclipse.ecf.provider.remoteservice_1.3.0.v200
22      RESOLVED  org.eclipse.ecf.provider.remoteservice_1.3.0.v200
23      ACTIVE    org.eclipse.ecf.server.generic_1.2.0.v20080623-00
24      ACTIVE    org.eclipse.ecf.sharedobject_1.3.0.v20080623-0046
25      ACTIVE    org.eclipse.ecf.ssl_1.0.0.v20080611-1715
26      ACTIVE    Master=12
27      ACTIVE    org.eclipse.equinox.app_1.1.0.v20080421-2006
28      ACTIVE    org.eclipse.equinox.common_3.4.0.v20080421-2006
29      ACTIVE    org.eclipse.equinox.event_1.1.0.v20080421-2006
30      RESOLVED  org.eclipse.equinox.http.jetty_1.1.0.v20080421-2006
31      RESOLVED  org.eclipse.equinox.http.servlet_1.1.0.v20080421-2006
32      RESOLVED  org.eclipse.equinox.preferences_3.2.200.v20080421-2006
33      RESOLVED  org.eclipse.equinox.registry_3.4.0.v20080516-0950
34      ACTIVE    org.eclipse.osgi.services_3.1.200.v20071203
35      ACTIVE    org.eclipse.rap.demo.gmaps_1.1.0.v200811271358
36      ACTIVE    org.eclipse.rap.jface.databinding_1.1.0.v20080613-1055
37      ACTIVE    org.eclipse.rap.jface.rwt.q07_1.1.0.v20080613-1055
38      ACTIVE    Master=34
39      ACTIVE    org.eclipse.rap.rwt_1.1.0.v20080613-1055
40      ACTIVE    Fragments=33
41      ACTIVE    org.eclipse.rap.ui.views_1.1.0.v20080613-1055
42      ACTIVE    org.eclipse.rap.ui.workbench_1.1.0.v20080613-1055
43      ACTIVE    org.morthay.jetty_5.1.14.v200806031611
44      ACTIVE    org.objectweb.asm_3.0.0.v200811271358
45      ACTIVE    org.robokart.av.control.ecf.discovery_0.1.0
46      RESOLVED  org.robokart.av.control.ecf.publisher_0.1.0
47      ACTIVE    org.robokart.av.control.ecf.service_0.1.0
48      RESOLVED  org.robokart.av.control.rcp_0.1.0
49      RESOLVED  org.eclipse.equinox.launcher_1.0.100.v20080509-18
50      RESOLVED  Fragments=46
51      ACTIVE    Master=45
52      ACTIVE    r-osgi://127.0.0.1:9278#51 [45]

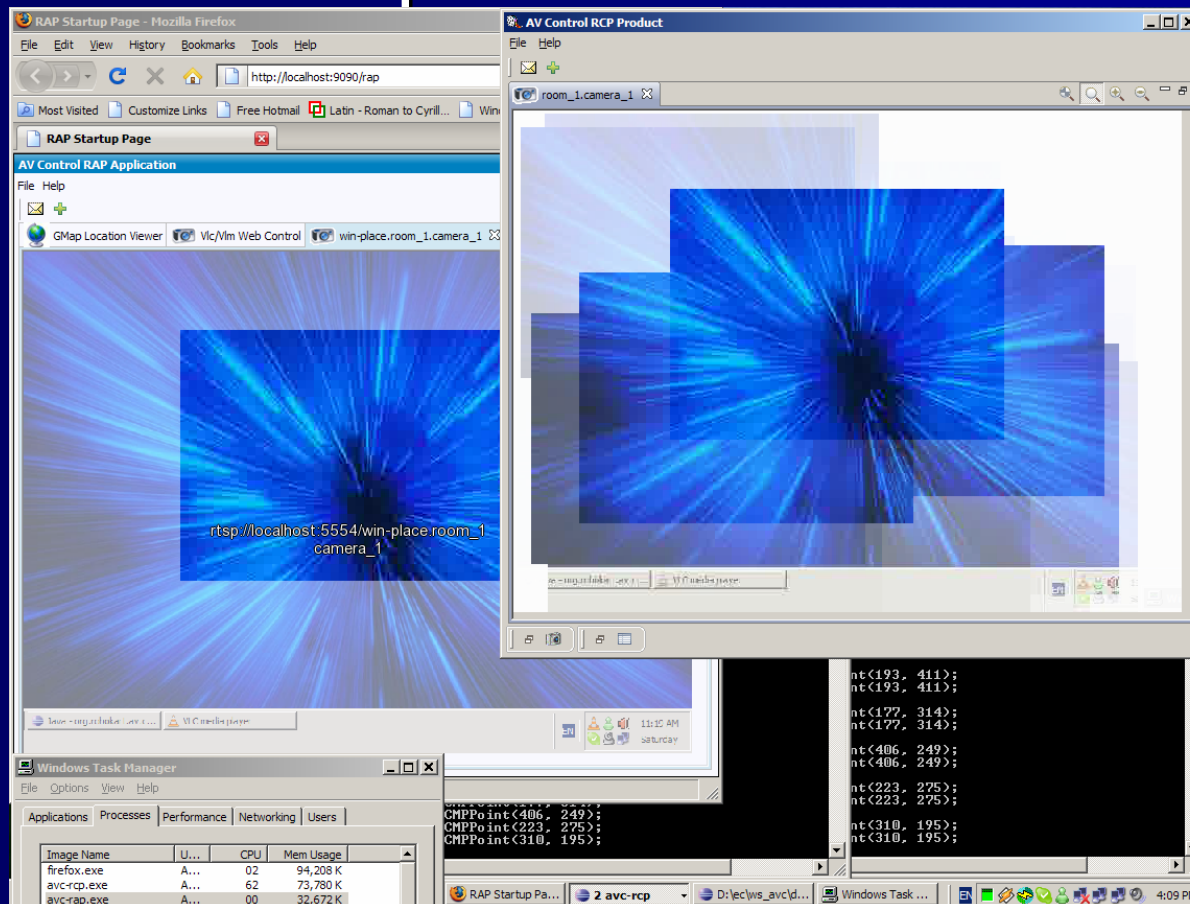
osgi>
```

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## Results in pictures – All on Windows 2003

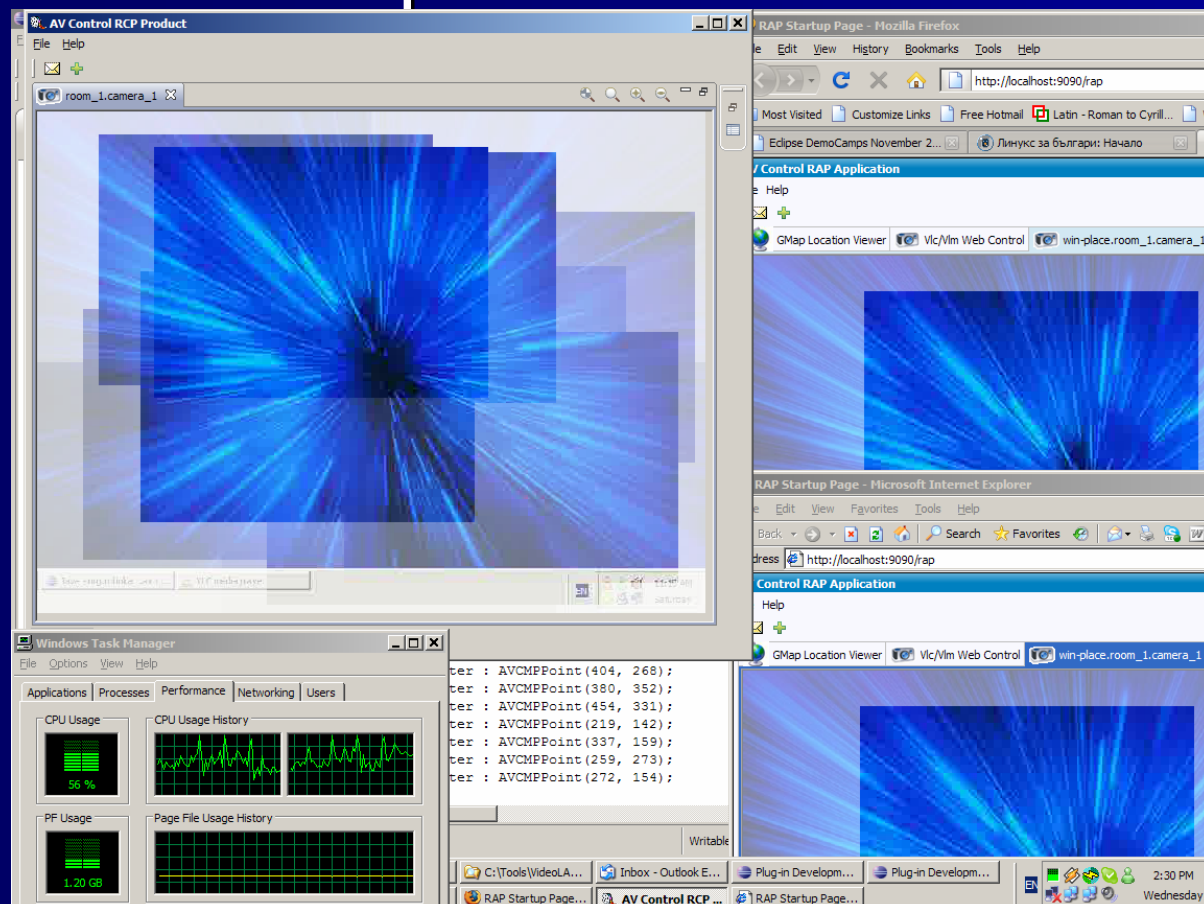


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## Results in pictures – RAP in both FF and IE

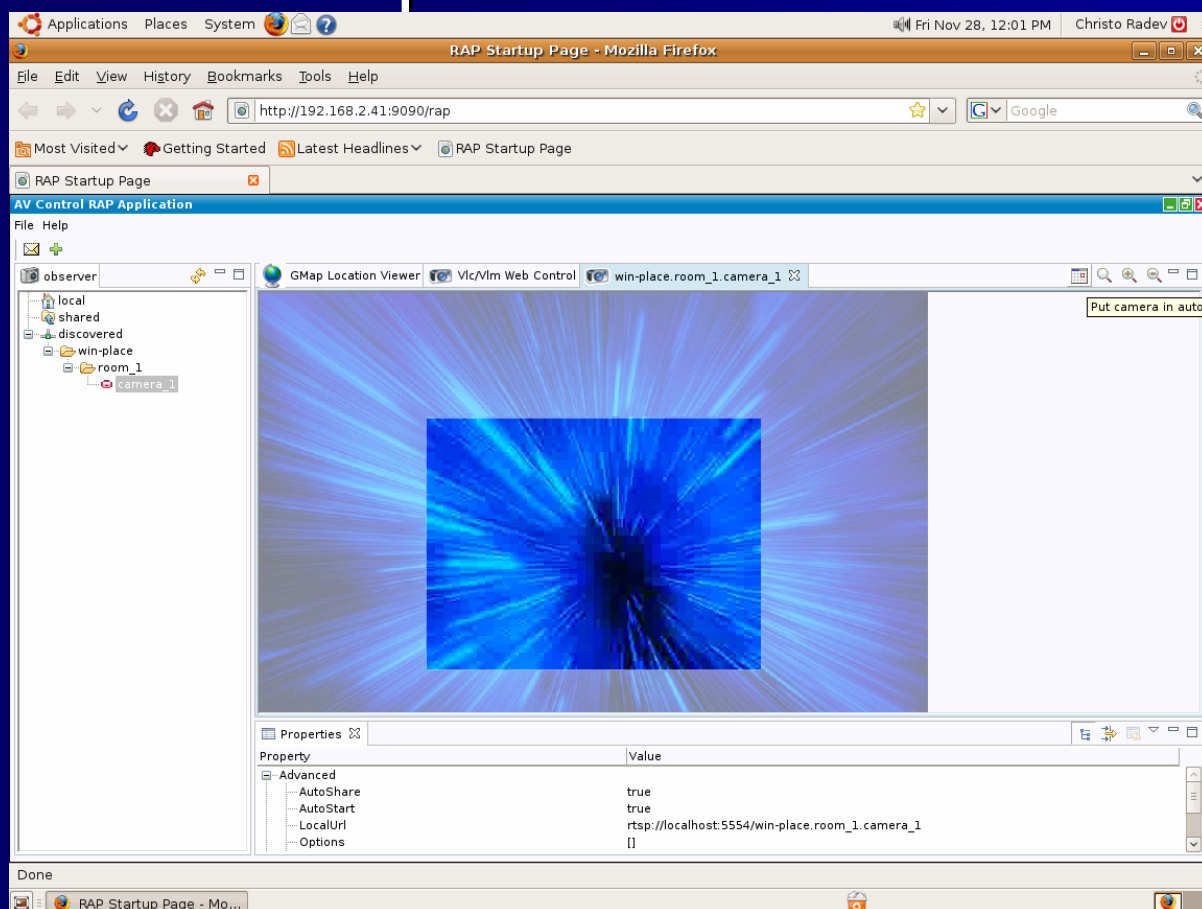


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## Results in pictures – RAP on FF and Ubuntu



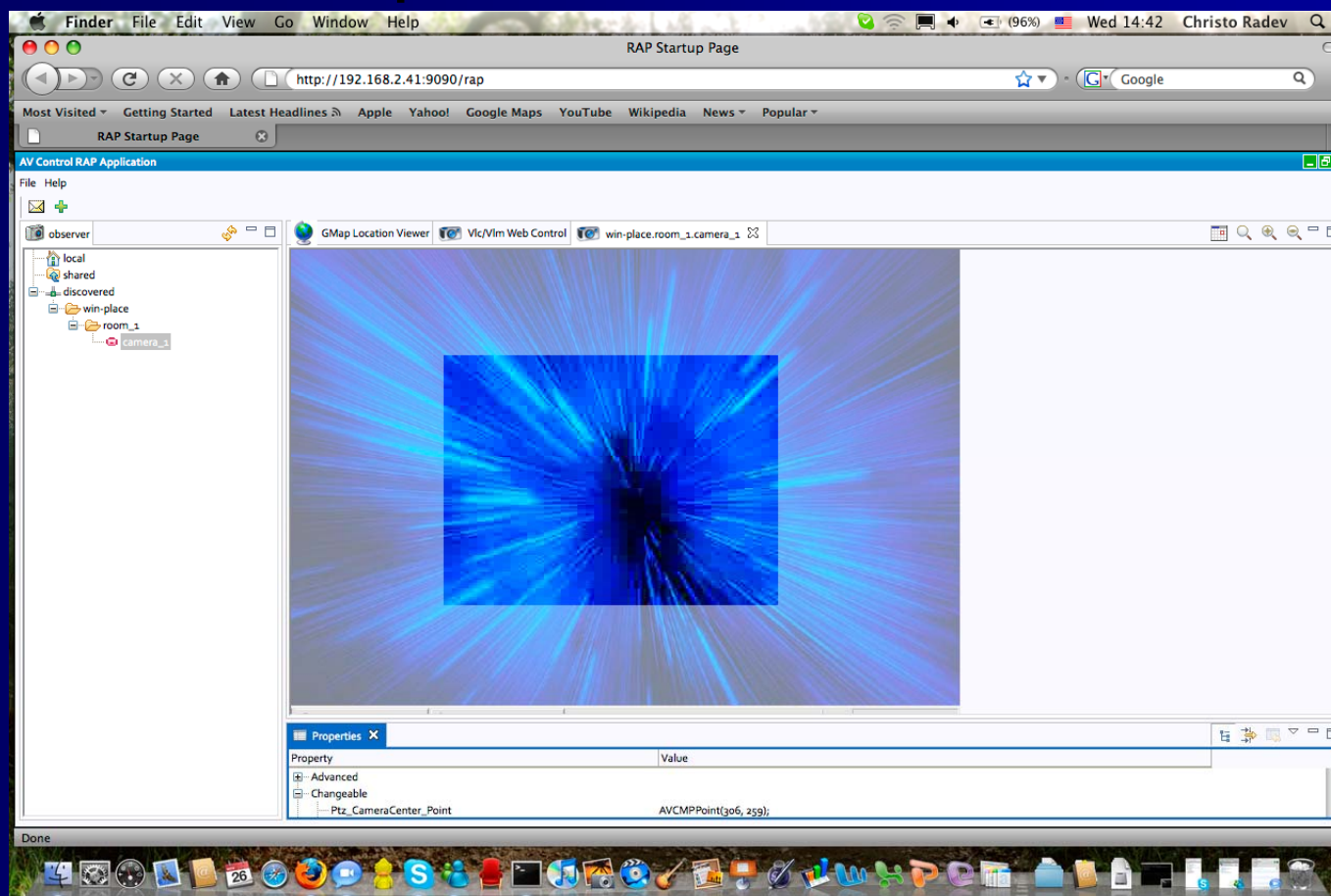


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## Results in pictures – RAP on FF and MacOS

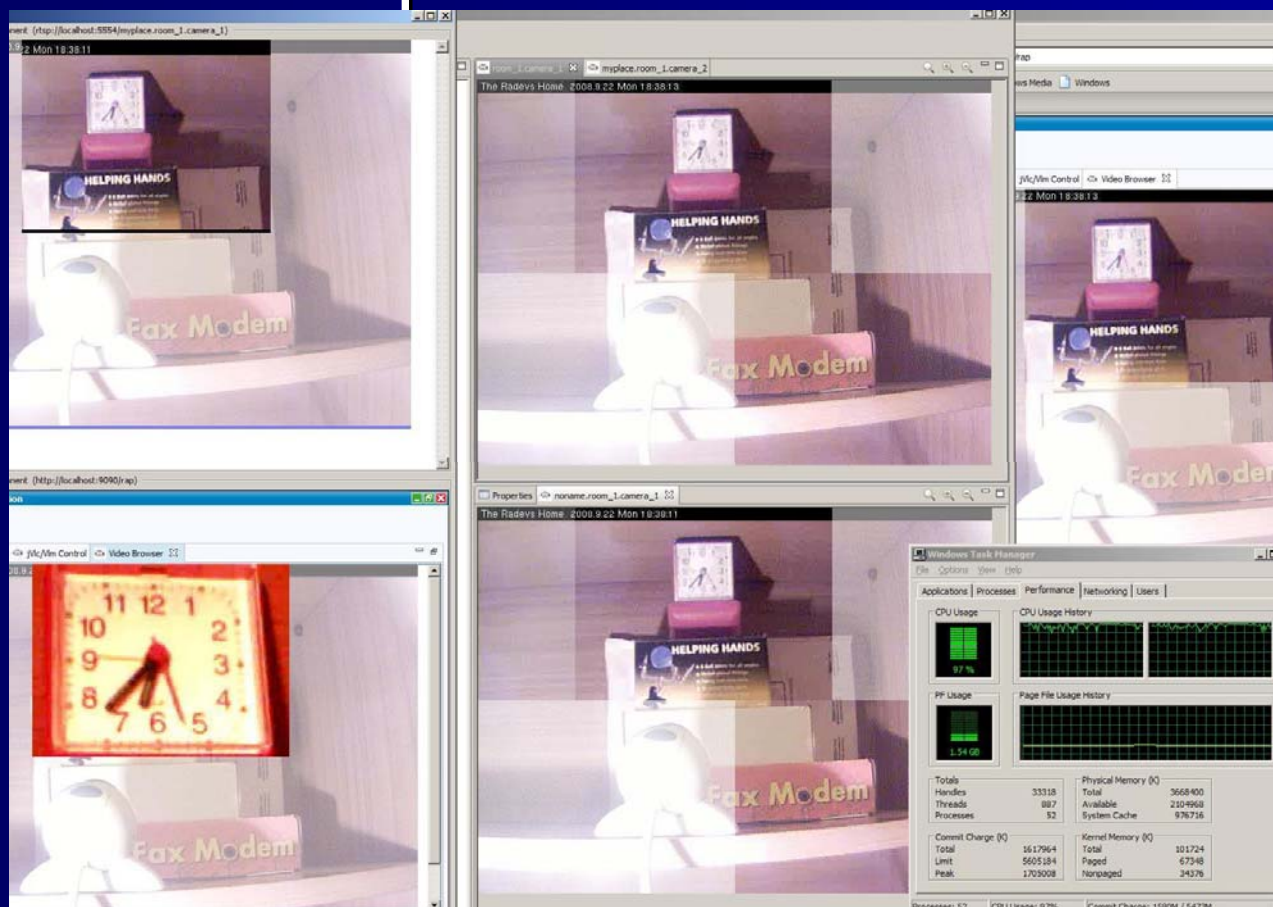


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## Results in pictures – Web and Net Cameras



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Thank you  
for your attention.

Any questions?