



VirCA

Virtual Collaboration Arena A 3D Collaboration Ecosystem





VirCA 3D Virtual Collaboration Arena

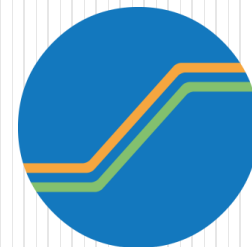


VirCA

3D Virtual Collaboration Arena



Aimed at a new system creation paradigm that inherently involves virtual reality and allows for merging the physical and the virtual worlds using resources from cloud services.



**MTA
SZTAKI**

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Cyber Physical Systems

Augmented Reality Virtual Commissioning

ROS Industrial Cloud Robotics

Industrie 4.0 CPS System of Systems

Big Data Internet of Things Cloud Computing

Virtual Reality

Vendor independent IoT ROS

Gazebo

Cloud Computing

Virtual Reality RT-Middleware

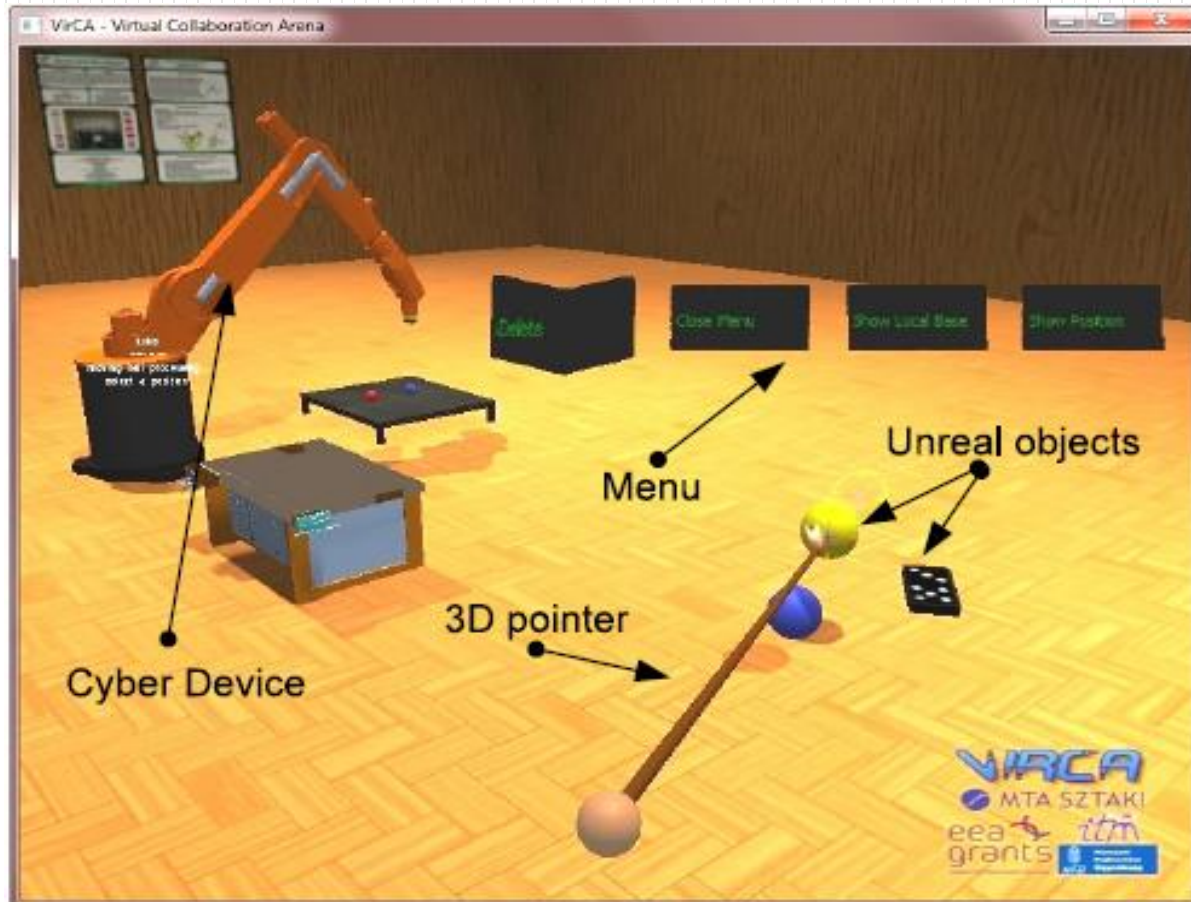
Cognitive Infocommunications

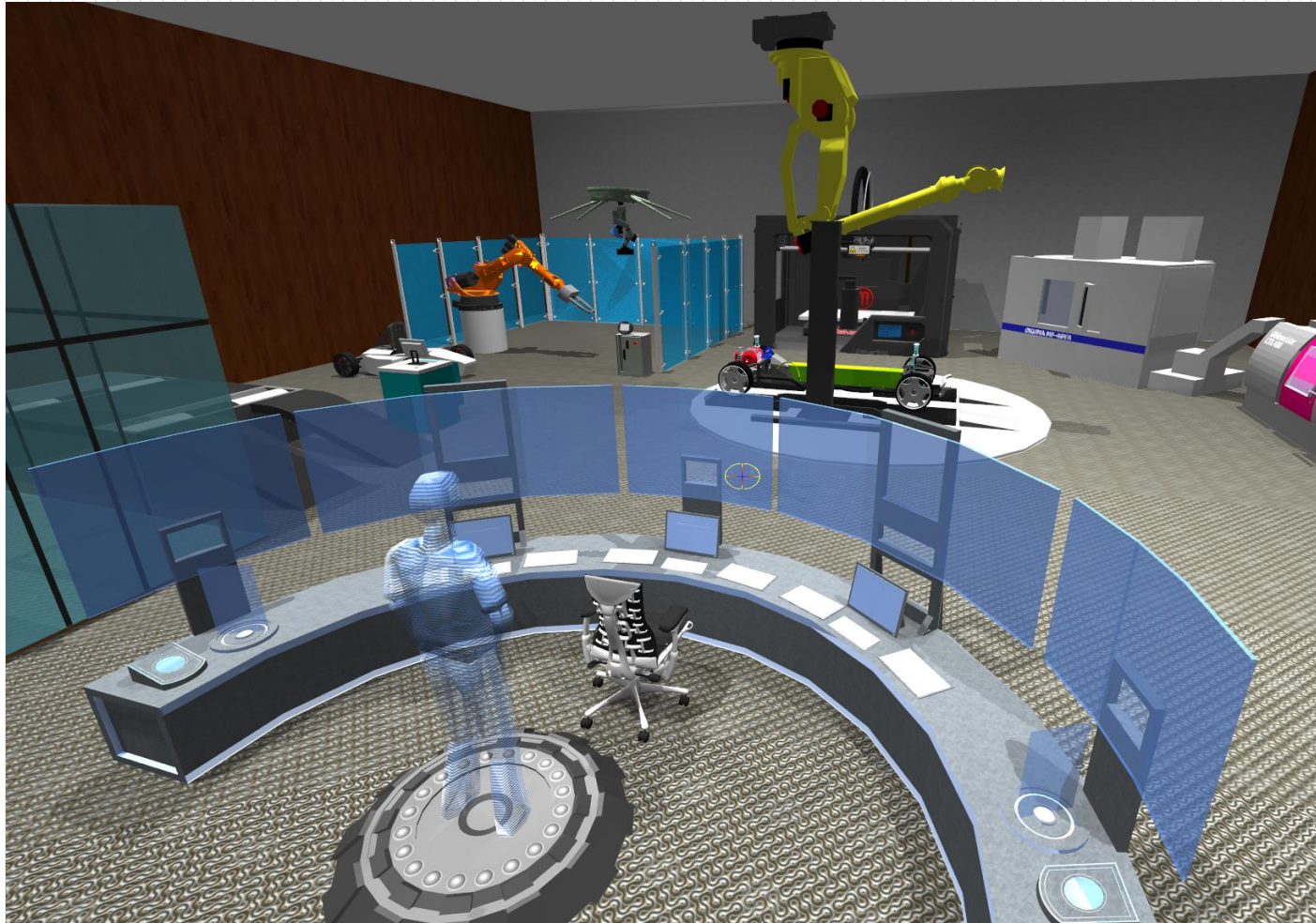
Component-based systems

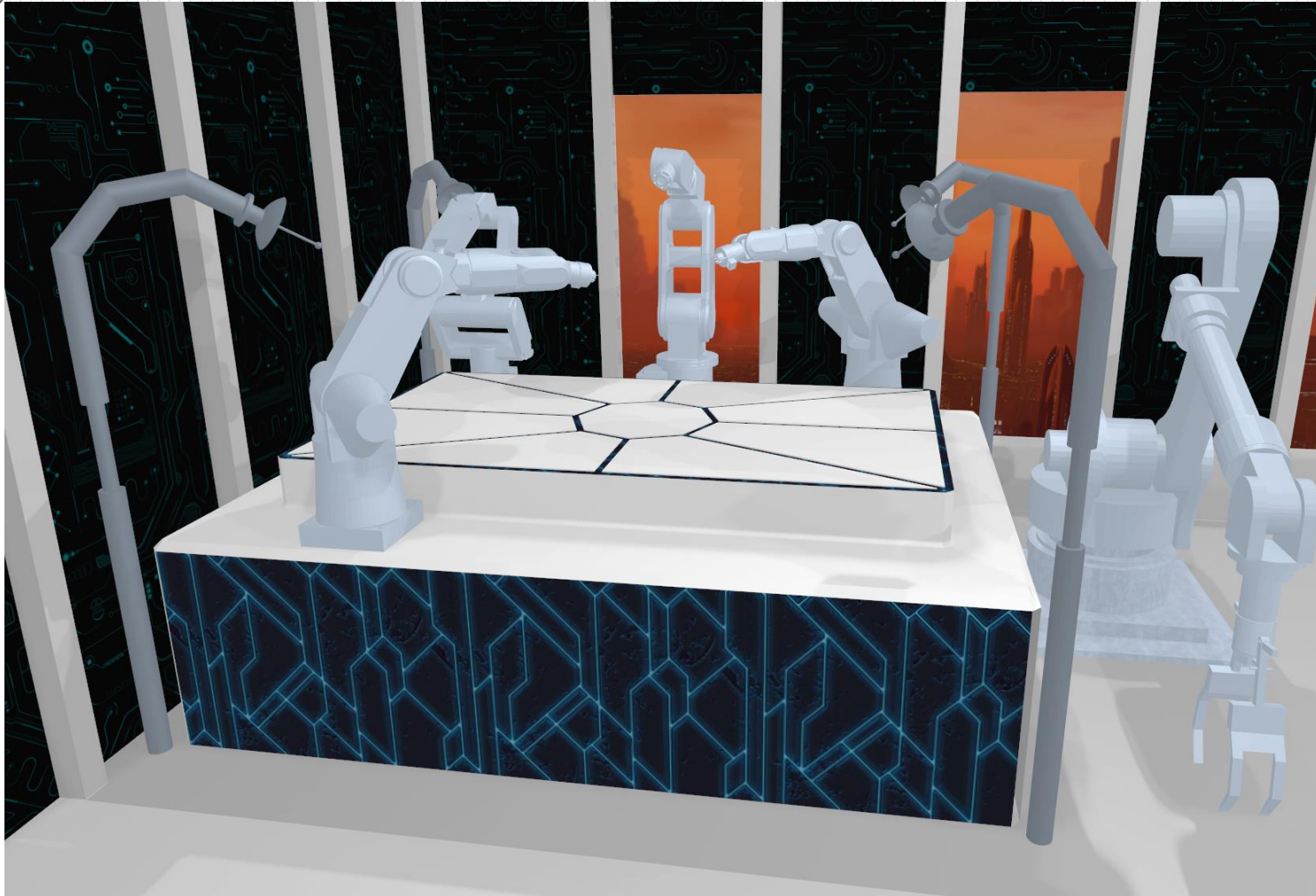
Augmented Virtuality



Objects in the VirCA scene







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Pillars of the VirCA philosophy



3D Internet-based collaboration



Augmented collaboration



AaaS-based cloud technology



Using future technologies today



3D Internet-based collaboration



Tokyo, Planning



Cologne, Certificate



Budapest, Manufacturing





Augmented collaboration (AC)



Virtual entities



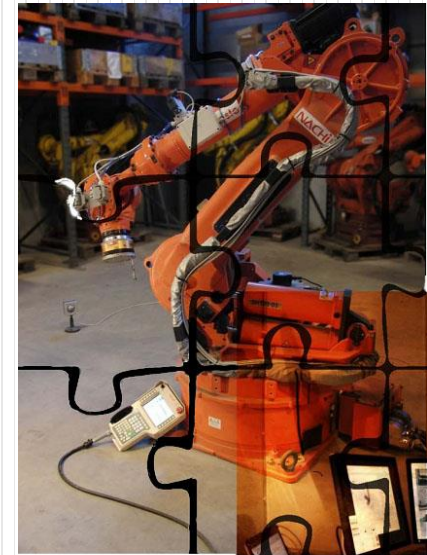
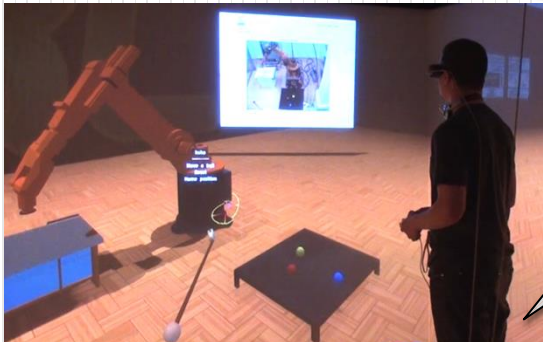
Real entities



Shared Virtual environment



AC

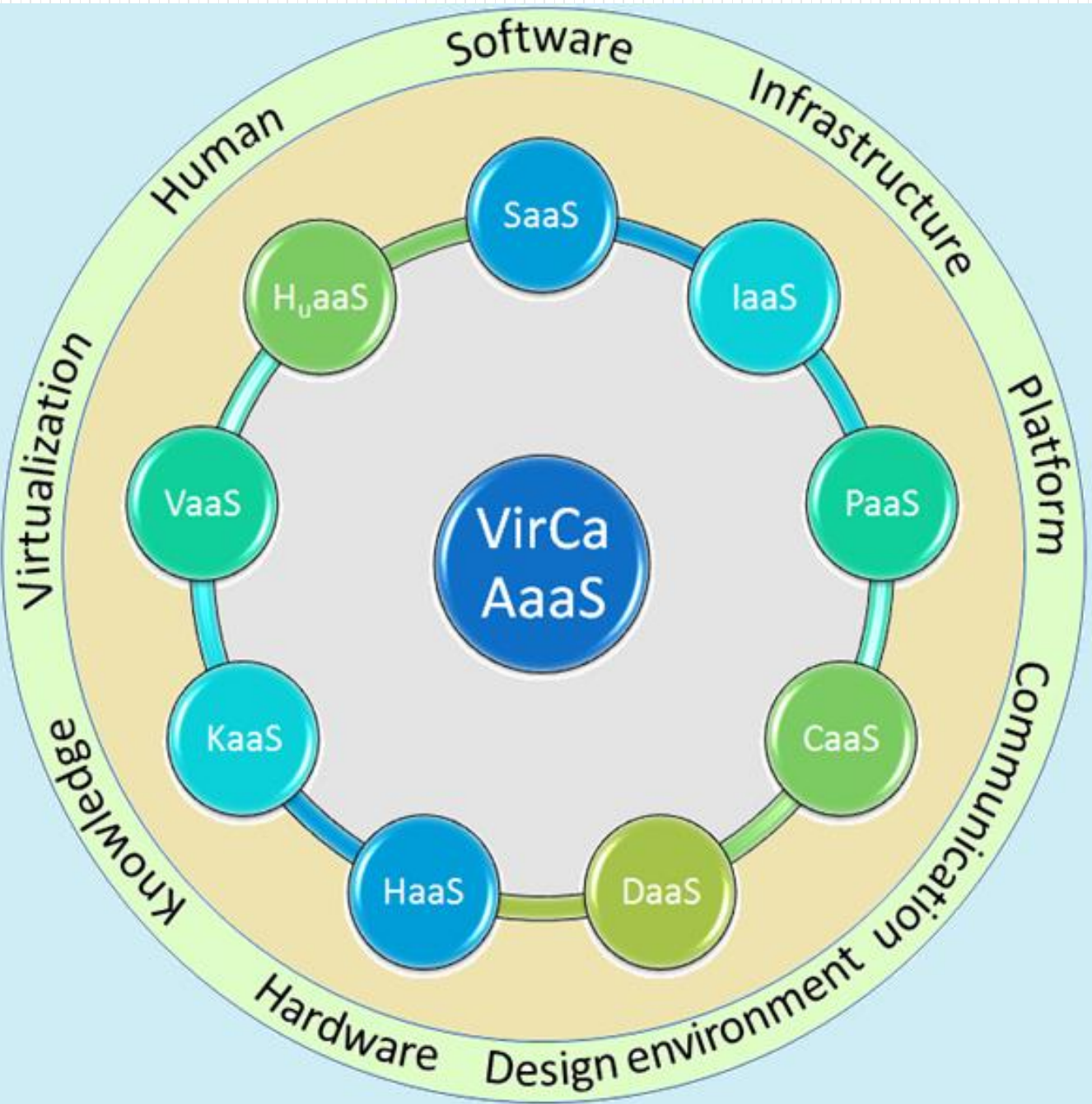


involving the REALITY -> Shared workspace, Remote control, Remote Monitoring



VirCA and the Cloud Technology





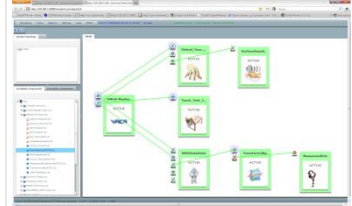


Knowledge from the community cloud



Robot Navigation

Speech synthesis



Speech recognition

Computer vision

Web based system editor

Shared virtual environment

VirCA



Real robot

Knowledge from the community cloud

The screenshot displays a web-based system topology tool. The browser window shows the URL `http://192.168.1.1:8080/rtmext/rcse/index.html`. The application interface includes a menu bar with options like 'Workplace', 'Action', 'Session', 'Settings', 'Help', and 'DEMO'. The main workspace is titled 'MAIN' and shows a diagram of system components. On the left, there is a sidebar with 'System topology' and 'Available components' sections. The 'Available components' list includes a tree structure starting with 'root' and sub-items like 'Cave3D.host_cxt', 'CoolerMaster.host_cxt', 'PERSA-PC.host_cxt', and 'SurfaceSoundRTC0.rtc'. The main diagram shows several components in green boxes, each with an 'ACTIVE' status and a small icon. These components are interconnected with green lines. The components shown are: 'Virtual_Touc...' (hand icon), 'SurfaceSound..' (speaker icon), 'VIRCA-Master..' (VIRCA logo), 'Touch_Test_I..' (table icon), 'NAODataSuite..' (robot icon), 'Transform2Na..' (3D coordinate system icon), and 'MeasurandDat..' (robot icon). The status of each component is indicated by a small icon: a green circle with a checkmark for active, a red circle with an 'X' for inactive, and a blue circle with an 'X' for a specific state. The bottom status bar shows the time '15:07:24.895' and some technical information.

Deployment models of VirCA

Public clouds

GAZEBO

Gazebo is a 3D multi-robot simulator with dynamics. It is capable of simulating a population of robots, sensors and objects in a three-dimensional world. It gives realistic sensor feedback and plausible interactions between includes an accurate simulation body physics).

GAZEBO

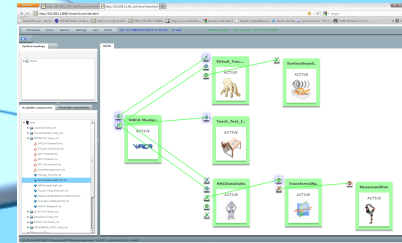


ROS.org

ROS (Robot Operating System) provides libraries and tools to help software developers create robot applications. It provides hardware abstraction, device drivers, libraries, modules, message-passing, package management, and more.



Community cloud



Private clouds





Technology background is almost ready...





But... Security? Robustness?



 **ROS**

 Open Source Robotics Foundation

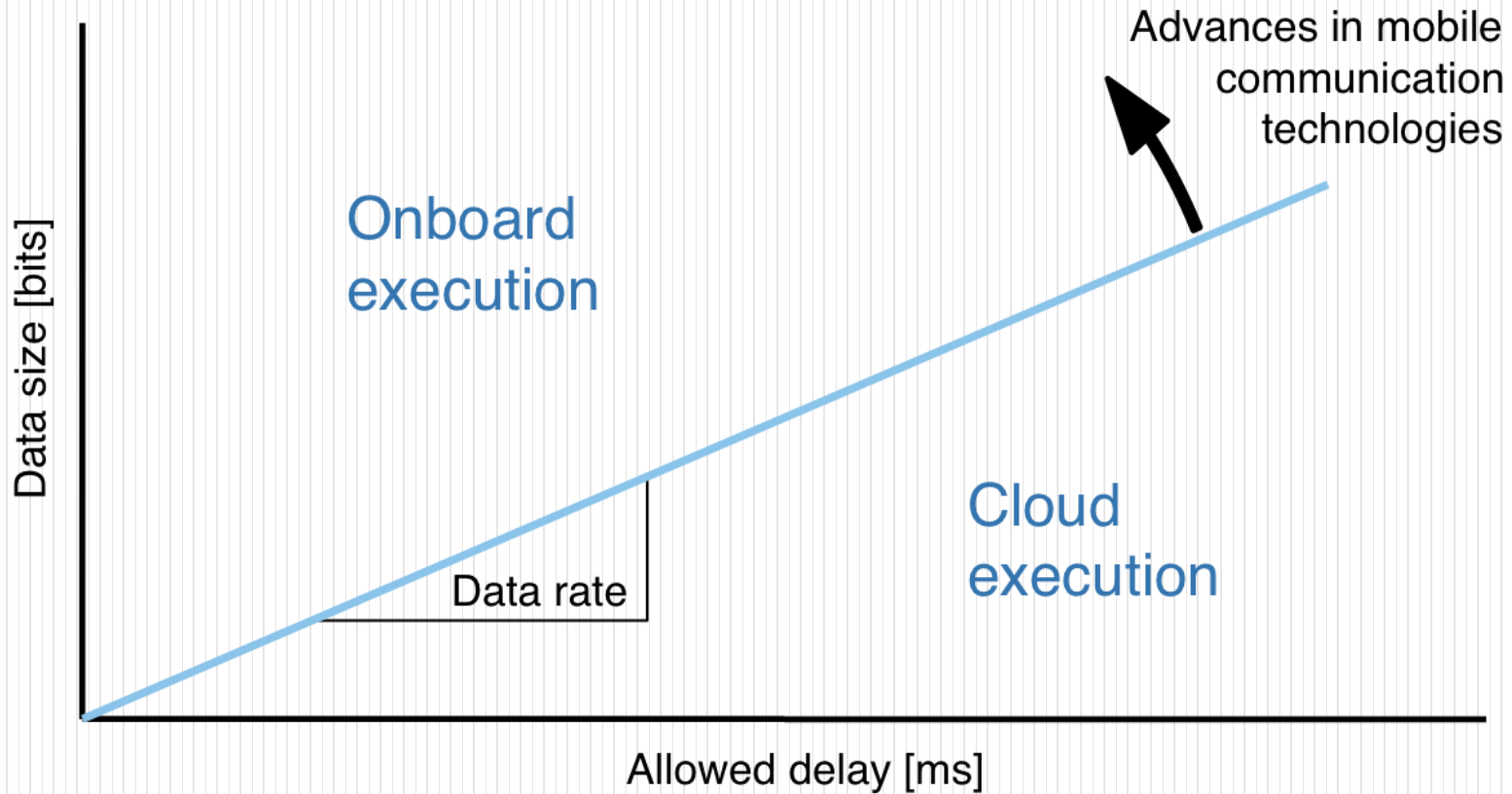
RT
MIDDLEWARE


DDS


RTMSafety™



What to run in the cloud?



<http://www.roboearth.org/wp-content/uploads/2013/02/Cloud-Robotics-Communication-Data-Rates.png>

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www.virca3d.com

- Free software
- Running on MS Windows
- Support: VirCApedia, mailing list
- Expert support from MTA SZTAKI and ABC-iROB

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Thank you!

www.virca3d.com

