Google sites   Group 5 - Platform as a Service (PaaS),

Infrastructure as a Service (IaaS)   a minute ago

	Create page
	Edit page
	More actions

CSE445Fall2009

Search this site

Group 5 - Platform as a Service (PaaS), Infrastructure as a Service (IaaS)

Group members: Jennifer Dischler, Nathan Edwards, Candost Kilic

Contents
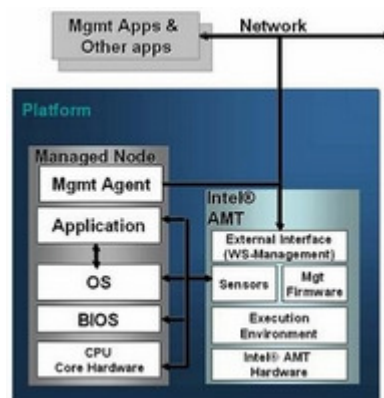
Intel's Conceptual PaaS

Architecture - AMT[1]
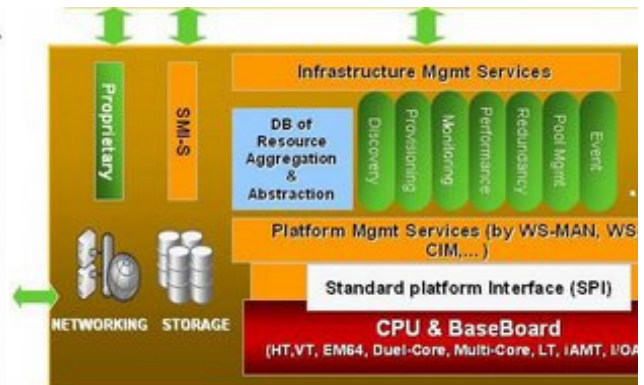
Example of Service Oriented IaaS Framew

Platform as a Service

Platform as a Service (**PaaS**) can be described as providing a complete computing solution (hardware and supporting software or firmware) as a distributed service in a Service Oriented Computing environment. Some sources define PaaS as hardware and firmware based autonomous devices that provide standard services to interact with other parties in a service oriented architecture[1]. While other sources discuss PaaS as generally hosted, Web-based application-development platforms, providing end-to-end or partial environments for developing full programs online[2]. Regardless of the type, platform services constitute basic building blocks for SOI and interact with other orchestration and management services from SOM as well as to provide seamless services to the SOA layer[1]. This includes treating computer hardware resources, memory components, networking hardware, and application development tools as virtual services much like software is to the Software as a Service (**SaaS**) paradigm[3]. Through PaaS, users can build their applications with the provider's on-demand tools and collaborative development environment[3]. The platform services can also provide system level control of hardware and software resources to manage the synchronization and concurrency issues that typically challenge any type of operating system. Software execution of some distributed operations can have much latency, and in these cases are handled much faster by hardware[3].

Common Features of PaaS:

- **Service Abstractions** - "basic service units" that hide hardware and firmware implementation details. The abstraction keeps the service autonomous and interoperable with other service providers / consumers [1].
- **Standard Interface** - has to support open service standards like Web Services – SOI, SOA, and SOM will interact with PaaS components the same way as they interact with software components [1].
- **Change Tolerant** - Platform is flexible, programmable and provides basic services upon installation with or without software. It will interact and adapt to the environment it was applied and behave appropriately [1].
- **Policy Driven** - PaaS service has to understand the response to policies that dictate an IT environment. PaaS could have a built-in policy engine to interpret policies down-loaded from the IT environment[1].
- **Multi-tenant Architecture** - PaaS service should support use by many concurrent users, by providing concurrency management, scalability, failover and security [4].

Concepts of a Good PaaS Design:

- The design must be responsive (i.e. minimal latency following real-time operating system (RTOS) principles.)
- Design must use only minimal user configuration and a simple service interface (i.e. does not require multiple parameters to perform operation)
- Platform service must follow easy-to-use conventions and requires only minimal training (by user manual or WSDL service description)
- Mean time to failure (MTTF) of hardware must be accounted for when publishing the service.

Conceptual design of distributed embedded sensor platform service:
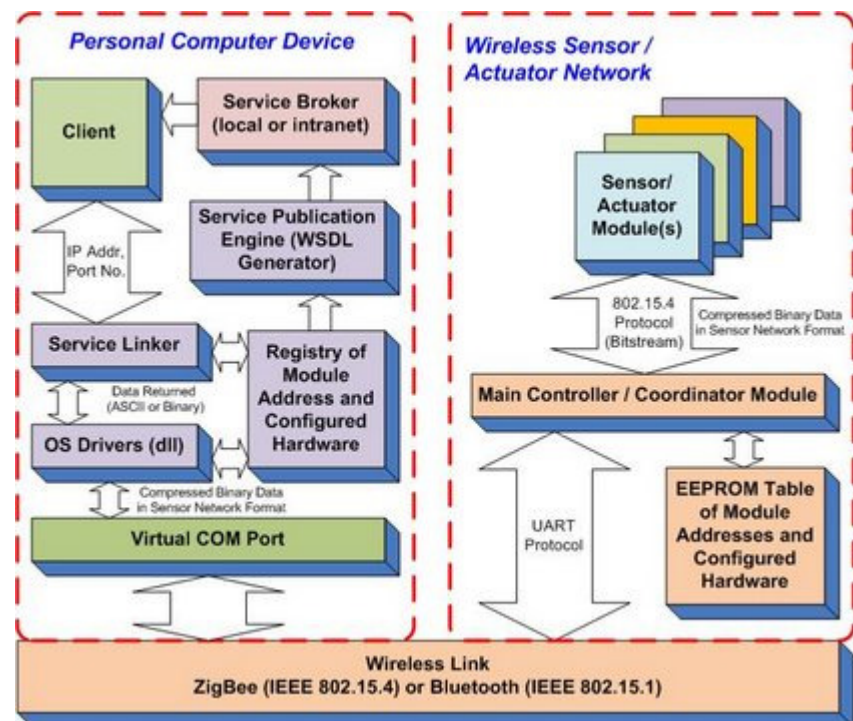
(current research by N. Edwards and J. Rosenthal on open platform embedded systems, Center for Cognitive Ubiquitous Computing, Arizona State University)

Advantages of PaaS:

- Platform services can allow for real-time system response such as required by mission-critical or safety-critical applications.
- The PaaS system's provider makes most of the choices that determine how the application infrastructure operates, such as the type of OS used, the APIs, the programming language, and the management capabilities[3].
- The platform offers end users an intelligent context-aware mobile portal, where procedures like service discovery, downloading, and adaptation

are fully tailored to terminal capabilities, user preferences, and network characteristics[5].

Disadvantages of PaaS:

- Long development cycle and complex designs when compared to fast changing SOA environments.
- Hardware and workflow may not be easily upgraded.
- Standardization of interface is difficult to accomplish in a relatively new SOC field.
- Higher production costs than software services (SaaS).

Some PaaS Providers:

- EmStar: Software for Wireless Sensor Networks[6]
- TinyOS
- Reflective Middleware for Mobile Computing (ReMMoC)[7]
- Open Platform as a Service[TM]
- Intel Active Management Technology (AMT)
- Salesforce.com

Visual Representation of PaaS by Force.com Advertisement[14]:

Force.com...The Platform is a Service

Infrastructure as a Service

Infrastructure as a Service (**IaaS**) is a service type where the client outsources their need of raw computer infrastructure, such as servers, storage, network components, to a company. IaaS along with PaaS and SaaS is a major component of cloud computing. So in a way we can think of IaaS as the next version of web hosting \ server renting in the clouds. IaaS used to be called HaaS: Hardware as a Service.[9]

Common Features of IaaS:

- Computer Resources delivered as a service: including servers, network equipment, memory, CPU, disk space, data center facilities[8]
- Computer Networking and Internet Connection provided for the hardware.[8]
- Maintainability of the infrastructure is done by the IaaS provider.[8]
- Client is charged for Utility Computing: (ex. per hour, or per gb)[8]

Advantages of IaaS:

- Scalability/Elasticity: Ability to utilize cloud resources dynamically as needed.[13]
- Availability and Reliability: Around the clock maintenance already done by the IaaS provider, so you don't have to worry about hardware issues.[13]
- Performance: IaaS harnesses the power of cloud computing which overpowers the traditional single server setups.[13]
- Cost-Effectiveness: It is much cheaper to rent IaaS then it is to buy and maintain your own servers, internet connection, etc.[13]

Disadvantages of IaaS:

- Privacy Loss: You are handing your data to a third-party (IaaS) which can see your data[12]
- Flexibility: You are tied down to technologies offered by the IaaS provider, can't install your own applications[12]

Some IaaS Providers:

- 3Tera[8]
- Amazon EC2[8]
- Akamai[8]
- GoGrid[8]
- RightScale[8]

Some sites that use IaaS Providers:

- Adobe.com[17]
- IFixIt.com[18]
- Myspace.com[17]
- Metacafe.com[17]
- IntlNewsMedia.net[16]

More Information on IaaS:

More information about advantages of IaaS can be found on this video by Stanford:

Sources:

1. M. Chang, J. He, E. Castro-Leon. "Service-Orientation in the Computing Infrastructure." Oct 2008, Shanghai. Proceedings of the Second IEEE International Workshop on Service-Oriented System Engineering, 2006. SOSE '06. DOI: 10.1109/SOSE.2006.35
2. G. Lawton. "Developing Software Online With Platform-as-a-Service Technology." *IEEE Computer*, June 2008. 13-15. DOI: 10.1109/MC.2008.185
3. Y. Chen and W.T. Tsai. Distributed Service-Oriented Software Development. pp13-14. 2008 Kendall/Hunt
4. http://en.wikipedia.org/wiki/Platform_as_a_service

5. N. Houssos, A. Alonistioti, L. Merakos, M. Dillinger, M. Fahrmair, M. Schoenmakers. "Advanced adaptability and profile management framework for the support of flexible mobile service provision" *IEEE Wireless Communications*, Aug. 2003. 52-61. DOI: 10.1109/MWC.2003.122497

6. L. Girod, N. Ramanathan, J. Elson, T. Stathopoulos, M. Lukac, D. Estrin. "Emstar: A software environment for developing and deploying heterogeneous sensor-actuator networks." *ACM Trans. Sen. Netw.* 3, 3 (Aug. 2007), 13. DOI: 10.1145/1267060.1267061

7. P. Grace, G. Blair, S. Samuel. "A Reflective Framework for Discovery and Interaction in Heterogeneous Mobile Environments." *ACM SIGMOBILE Mobile Computing and Communications Review*. 2 - 14. Volume 9 , Issue 1 (January 2005). DOI: 10.1145/1055959.1055962

8. http://en.wikipedia.org/wiki/Infrastructure_as_a_service

9. http://searchcloudcomputing.techtarget.com/sDefinition /0,,sid201_gci1358983,00.html

10. http://www.platformasaservice.com/

11. http://news.cnet.com/8301-19413_3-10140278-240.html

12. http://www.mohamedfawzy.com/?p=31

13. http://www.youtube.com/watch?v=9AS8zzUaO3Y#

14. http://www.youtube.com/watch?v=EbnCUqAL6UM

15. http://aws.amazon.com/ec2/

16. http://www.3tera.com/Customers/

17. http://www.akamai.com/html/customers/index.html

18. http://www.rightscale.com/customers/

Attachments (0)

Comments (0)