

Alex Lundin

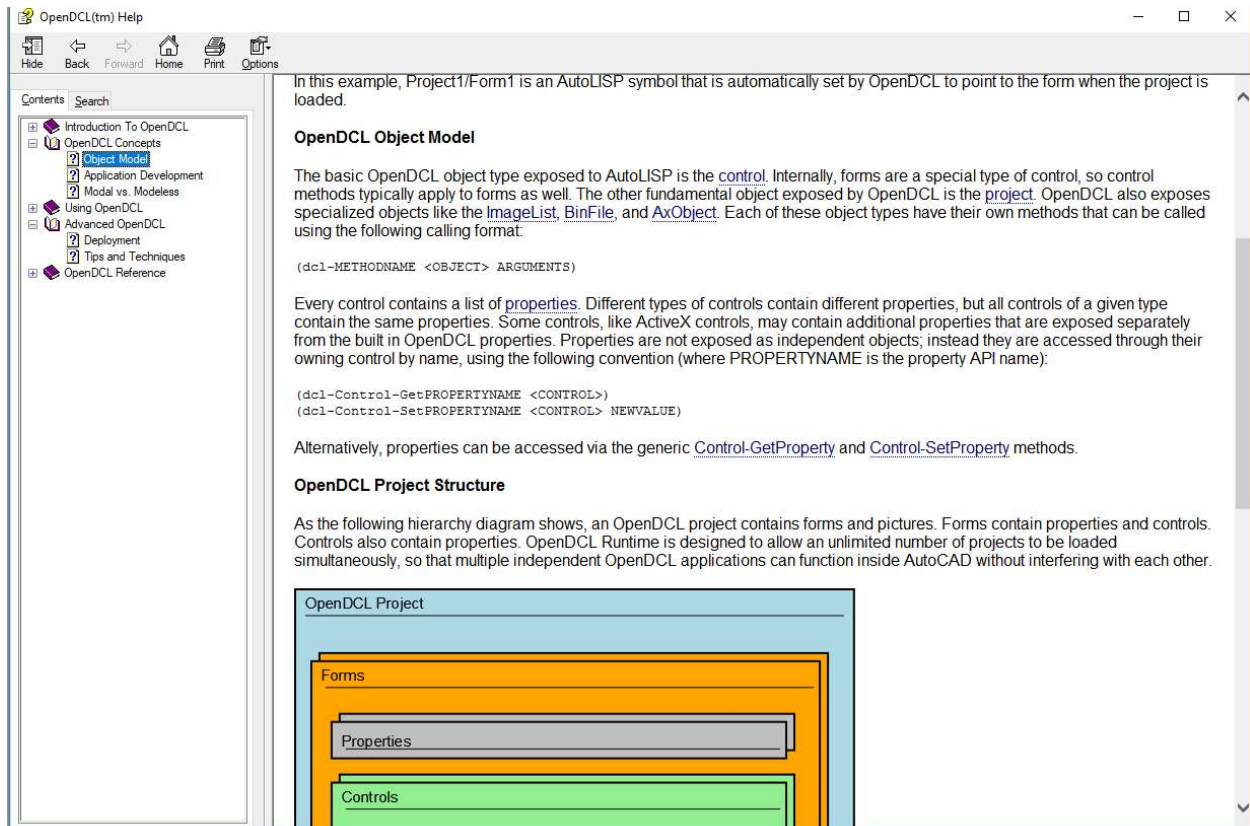
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Question 1

Go to the architecture of your favorite open source system. On the site, look for the architectural documentation for that system. What is there? What is missing? How would this affect your ability to contribute code to this project? (Chapter 18, question 1)

This is my favorite open source project.

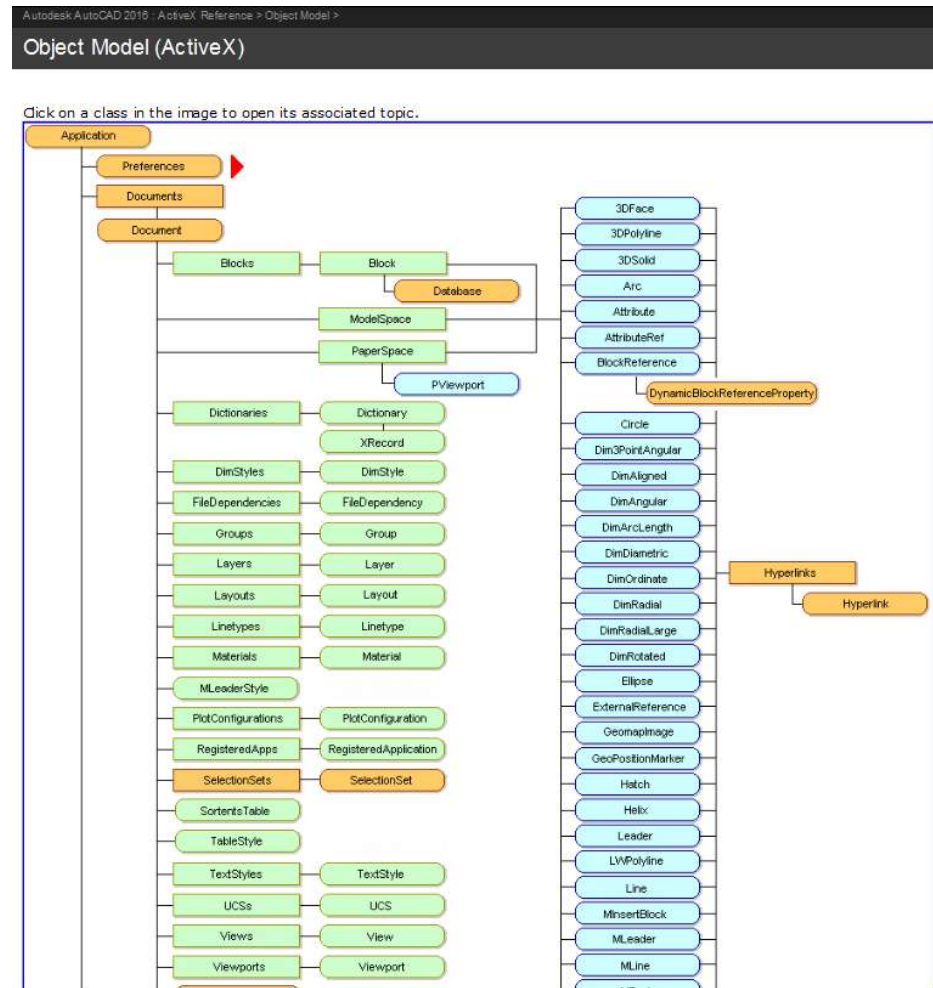
<https://sourceforge.net/projects/opendcl/>



They do a great job documenting their object model, so end users can build with the architecture provided. OpenDCL provides everything a developer needs to leverage the existing architecture. They would need to include lower level documentation if they wanted end users to assist in bug fixes of the architecture itself. I have no idea where to begin with fixing anything that is inside their compiled executable program. The documents they provide are great for using the product they provide to build more tools. However the documents do not describe how to edit the product itself.

In contrast, this is my favorite paid program.

AutoCAD by Autodesk



There is a plethora of architectural documents that make it easy for me to understand the object model and this makes customizing the product much less time consuming. Architectural documents are a must have for anyone who wants to encourage end users to build onto their Architecture. Same thing as OPENDCL, AutoCAD does not describe how to edit the end product final executable program.

Banks are justifiably cautious about security. Sketch the documentation you would need for an automatic teller machine (ATM) in order to reason about its security architecture. (Chapter 18, question 2)

We would need:

1) Module and CC views

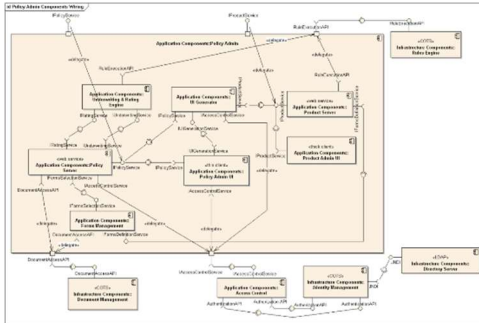


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2) A utility tree

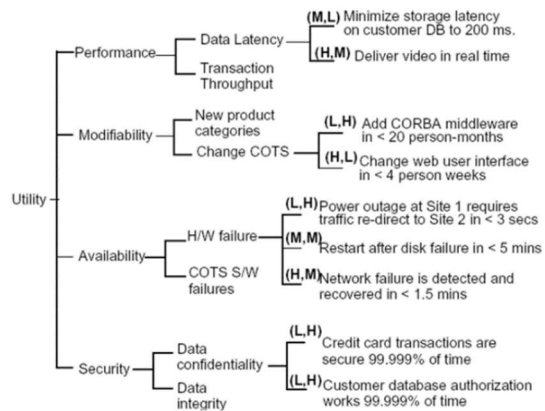
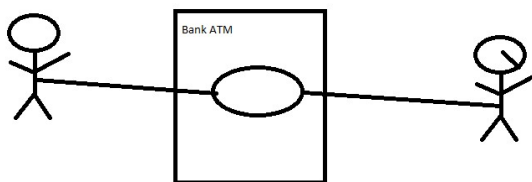


Image from reference [1]

3) Use case diagrams



Question 3

What is ATAM and what are some of its benefits? List the various steps involved in this process.

The ATAM is Architecture Tradeoff Analysis method. It is a process for identifying the relationships between qualities and risks. This document brings clarity to why a system designer evolved the way it did based on desired qualities and risks mitigated.

Benefits:

- Clarified quality attribute requirements
- Improved architecture documentation
- Documented basis for architectural decisions
- Identified risks early in the life-cycle
- Increased communication among stakeholders
- The most important benefit is improved architectures.

Steps:

1. Present the ATAM
2. Present Business Drivers
3. Present current Architecture
4. Identify Architectural Approaches
5. Generate Utility Tree/Scenarios
6. Analyze the approaches
7. Brainstorm and Prioritize
8. Analyze approaches again
9. Present Results

List from reference [1]

Question 4

A sender wishes to send a sensitive document (e.g. a legal contract) to a receiver.

How can the receiver be certain of who created and sent the document?

By using encryption. When the sender prepares the file, there is a hashing function that uses a key to encrypt the file. This way when the sender puts the file out into the open of the network, the file is more secure. Finally when the file gets to the receiver, the receiver decodes the file using a key. One of the most secure encryption algorithms is public key and private key. Which allows the sender to encrypt the file in such a manner than anyone with the public key can decode it, but only the specific receiver with the specific private key can decode it correctly, hence the receiver holds the private key.

Question 5

Can a firewall protect a private network against hackers trying to exploit critical information? Draw and describe how this can be achieved.

A single firewall can prevent the system from certain types of hackers, either hackers or internal. More layers of firewall makes it harder for either type of malicious programmer to exploit the system.

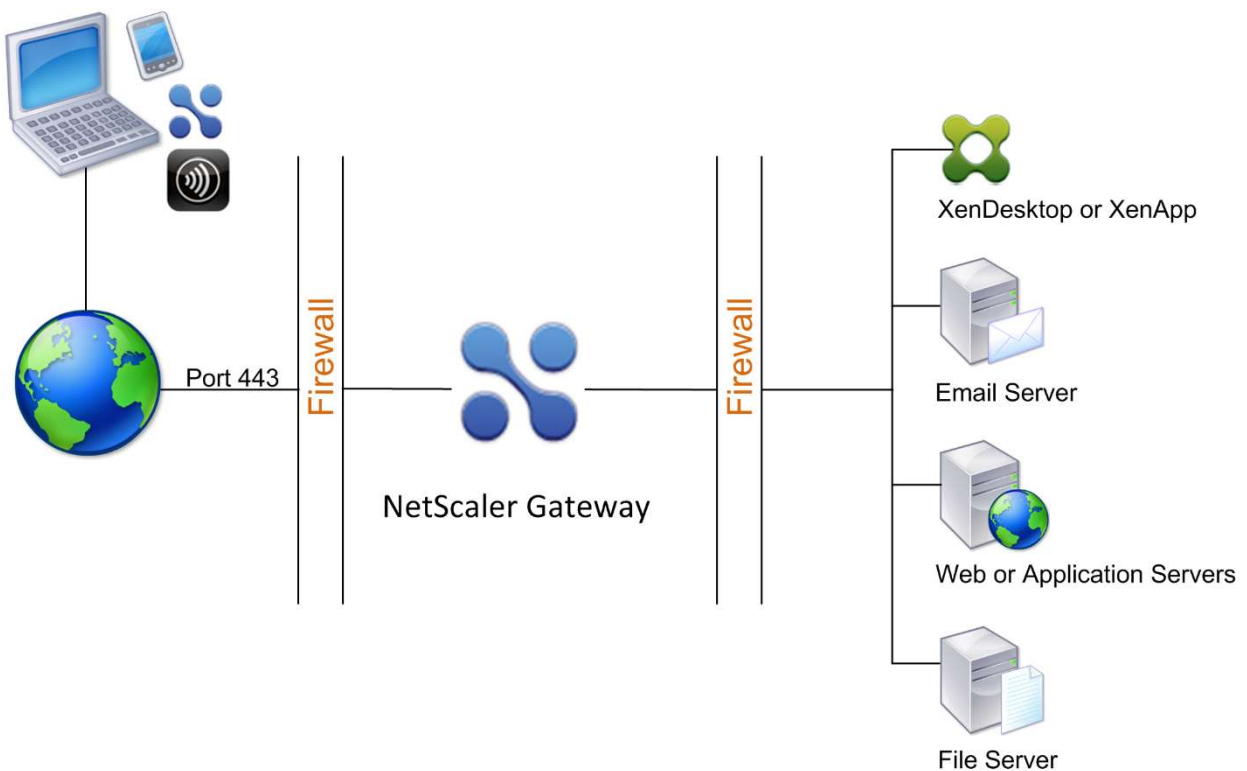


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References

[1] Dr. Pushpa Kumar, Lecture 16, Topic: "Module7", SE-4352.001, Software Engineering, University of Texas at Dallas, ECSS, 09/25/2018