

Varian's Integration & Developer Technologies

- DICOM Service + DICOM Worklist
- Aria Web Services
 - Documents Service
 - Aria Access Services
 - VAIS
- Aria Connect + HL7 (formerly called IEM)
- Mobius Web APIs
- Velocity APIs (Research Mode only)
- Eclipse Scripting API

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What is Varian DICOM Service?

- DICOM Service provides a network endpoint that allows for fully scripted data extraction and injection.
- Implements DICOM Standard networking protocol.
- Allows for connection and integration with any third party software that implements DICOM standard networking.
- Can extract and inject DICOM 3D Images (CT, MR, CBCT), 2D Images, RT Plan, RT Dose, RT Structure Set, RT Treatment Record and more.
- Runs as a Windows Service on any client computer that has connectivity to Aria DB in your RadOnc network.
- DICOM Service aka DICOM Daemon in earlier releases
 - Available since v8.x (approximately)

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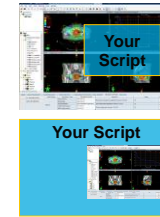
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What is Varian Eclipse Scripting API (aka ESAPI)?

- Application Programming Interface to Eclipse Treatment Planning System.
- Cleared for clinical use since v11.
- Implements writeable features that are cleared for clinical use since v15.1.
- C# programming language is used for clinical scripts
- python also allowed for research scripts with pyESAPI.

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Eclipse Scripts
Two approaches


Plugin Script

- Eclipse calls you!
- Operates on current patient

Standalone EXE

- You call Eclipse!
- Operates on any number of patients

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Your Script

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Your Script



www.proinformatik.de/medico/soe/soe-for-ramdots-rcscript-only

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This Demo

Start with CT + Structure Set Files



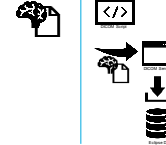
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This Demo

Start with CT + Structure Set Files

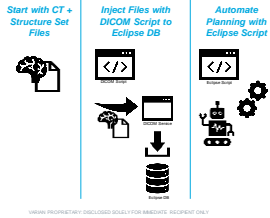
Inject Files with DICOM Script to Eclipse DB



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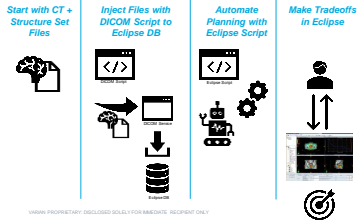
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This Demo



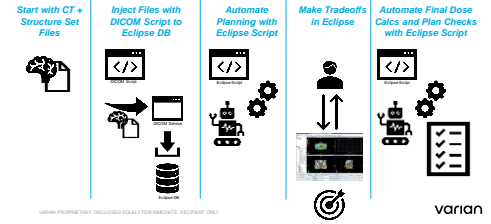
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This Demo



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This Demo



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Want more info?

- myVarian.com
- VarianDeveloper.com

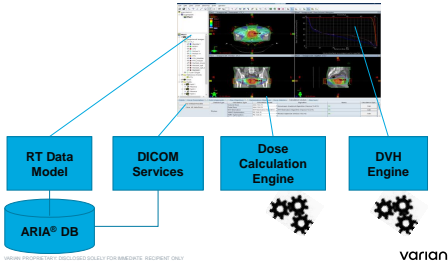
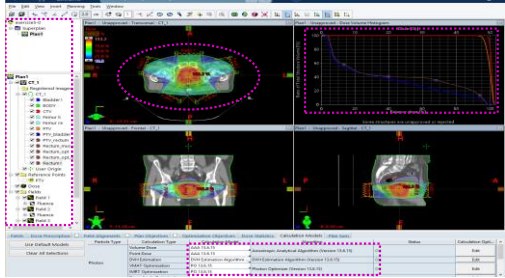
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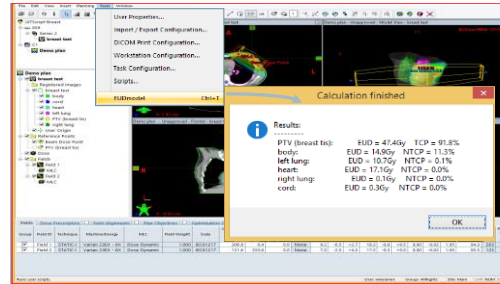
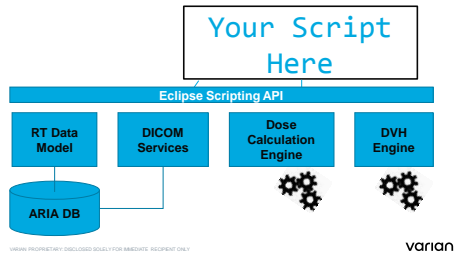


Background slides (if needed)



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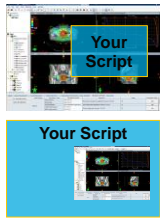


Multiple Varian Scripting APIs

Product	Description
Eclipse Scripting API (ESAPI)	C# scripting access to Plans, DVH engine, Dose, Structure Sets, Image data, voxels
SmartAdapt™ API	Rigid Reg, Deformable Reg, 2D, 3D images, DVF
Portal Dosimetry API	Access to Portal Dose, PD evaluation tests, analysis

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Varian Scripting with C#.NET

Scripts are created with **C#.NET**

Great modern language

Best in class tooling provided by Microsoft

Huge community (MSDN, StackOverflow)

Lots of help & open source examples

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Eclipse Scripting API Features by Version

	v.11	v13.6	V13.7	v.15.6
Access to Eclipse EXB Photon Data (Patient, Course, Plan, Beams, Structures, DVHs, Doses, Images,)	✓	✓	✓	✓
Access to Eclipse Autom				
Access to Eclipse Autom (Create Courses, Plans, Beams, Optimize & Calculate Dose)	-	rm	rm	✓
Script Approval	-	-	-	✓
Visual Scripting	-	-	-	✓

 **Cleared for Clinical Use**

rm = Available in Research Mode only
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Eclipse Automation

- Writeable Scripting
- Script Approval & Dev process support
- Targeted use cases:
 - Super-templated planning
 - Automated QA and QC
 - Optimization Structure creation

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www.prospectone.com/docinfo/eclipse/for-aminetes-ncsp01p01.pdf

Eclipse Automation - Approval

- Clinical development process support
- Write-enabled scripts must be approved
- Optional system setting to force read-only scripts to be approved



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What can I access through Mobius3D APIs?

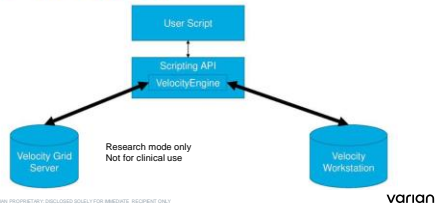
Everything you see in the UI

Overall results	Dose statistics	ROI statistics
<ul style="list-style-type: none"> • List of all patients • Pass/warn/alert status • What type of QA checks have been performed <ul style="list-style-type: none"> - Plan check - Pre-delivery QA - Treatment QA - QCOT analysis • Staff approvals 	<ul style="list-style-type: none"> • Mean dose and percent coverage to each target • DVH objectives <ul style="list-style-type: none"> - Pass/warn/alert for TPS and MSD - Actual values (ie, cc spared) - Full DVH data • 3D gamma passing rate • TPS and MSD 3D DICOM dose • Delivery time 	<ul style="list-style-type: none"> • Volume • Gamma passing rate • Mean dose

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Architecture API + VelocityEngine



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Varian DICOM Service

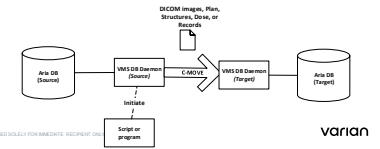
- Runs as Windows Service
- Aria DB Client
- Allows for programmable DICOM data flow in and out of Aria / Eclipse.
 - 3D Images (CR, MR, CBCT), 2D Images, Structures, Plans, Dose, Treatment Records, Registrations
- Scriptable / programmable with tools like DCMTK, DVTK, pyDICOM, PixelMed, EviiDICOM, FO-DICOM.
- Included with Aria systems since v8.x

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DB Daemon Supported Scenarios (1)

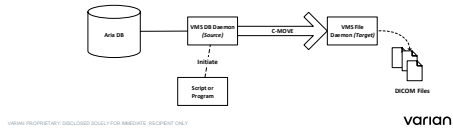
- DB Daemon to DB Daemon (E.g. Main Center to Collaborating Institution & Vice versa)
 - Programmatically send Image, Planning, or Treatment Data from one center to another through DB Daemons.



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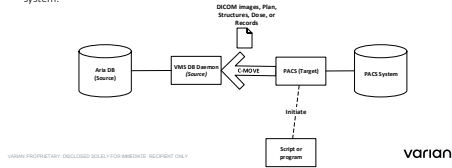
DB Daemon Supported Scenarios (2)

- DB Daemon to File System & Vice-versa
- Programmatically extract DICOM files from one Aria system to file share, or load files into an Aria system.



DB Daemon Supported Scenarios (3)

- DB Daemon to DICOM PACS & Vice-versa
- Programmatically send Images, Plans, and other DICOM objects to / from a PACS system.



DB Daemon Supported Scenarios (4)

- Eclipse to DB Daemon (Export from Eclipse, Import to Eclipse).
- Users can directly import a plan from one center to another using Eclipse Import.
- User can directly export a plan or other DICOM data from one center to another.

