YottaDB Management GUI
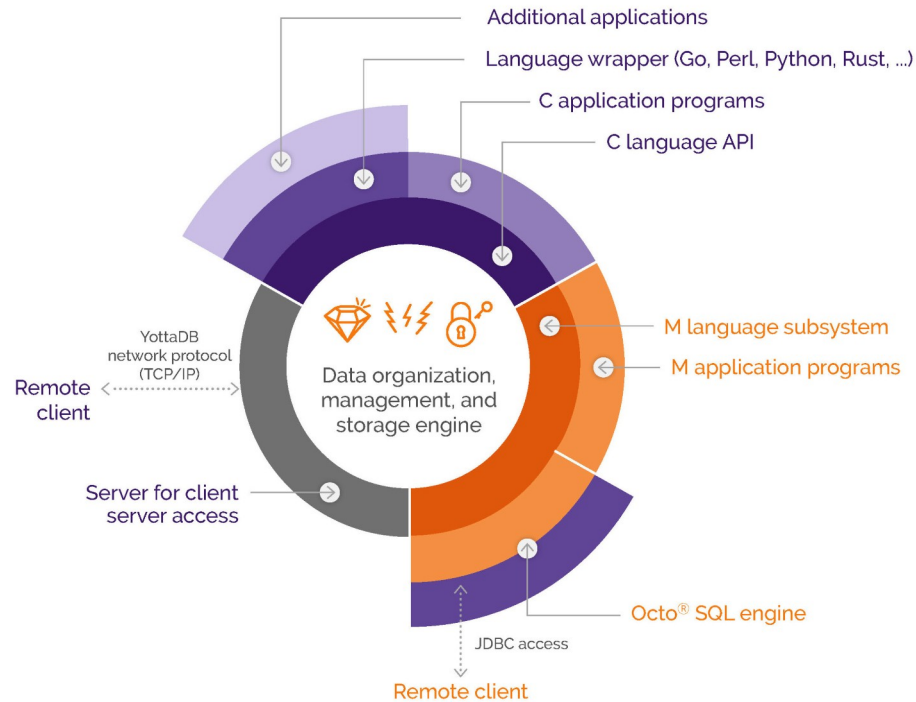
Third time the charm!

YottaDB® – https://yottadb.com

- A mature, high performance, hierarchical key-value, language-agnostic, NoSQL database whose code base scales up to mission-critical applications like large real-time core-banking and electronic health records, and also scales down to run on platforms like the Raspberry Pi Zero, as well as everything in-between.

- *Rock Solid. Lightning Fast. Secure. Pick any three.*

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Architecture

YottaDB

YOTTADB DATA-CENTRIC ARCHITECTURE

Data organization, management, and storage engine

- Additional applications
- Language wrapper (Go, Perl, Python, Rust, ...)
- C application programs
- C language API
- M language subsystem
- M application programs
- Octo® SQL engine

YottaDB network protocol (TCP/IP)

Remote client

Server for client server access

JDBC access

Remote client

Why a GUI?

- Do you remember how to change a key size on mupip?
  - Is it -key, or -rec?
  - How do you update the original GDE defintion?
  - Does it go on the region or segment?
- Is it mupip journal or mupip set to turn on a journal?
- How much free space do I have, and how much can I extend my database?
- Is my database file in good health right now?
- A GUI is for you!

History of our GUIs

- This is the 3rd iteration of a GUI for YottaDB

- First one was a prototype

- Second one built on the work of the first

- Both stacks were npm based (to create resources; served by M Web Server)
  - First GUI eventually didn't run anymore (Vue version became too old)
  - Addressing large dependency trees/security issues with npm isn't possible for a small team

Lessons learned (1/2)

- DO NOT USE npm
  - (we use it for testing with puppeteer though, but we keep the packages being used limited)
- Carefully control and minimize your dependencies
- Make sure that you can build your project without external dependencies and build steps

Lessons learned (2/2)

- Focus on providing functionality that users want

- Focus on using a user interface to simplify the view and administration of YottaDB

  - Previous user interfaces were more of proof-of-concepts, but did not address pain points for users

    - Developers usually don't need GUIs that much

    - Administrators do, and it needs to be simple

First Incarnation

SYSTEM ADMINISTRATON   **MONITORING**   **RESOURCES**

| Type to Search | | Clear |

| Save | Add |

Name ↑↓	Region ↑↓	File ↑↓	Actions
Default	DEFAULT	/opt/yottadb/gui/g/vehu.dat	Edit Delete
Local Locks	DEFAULT	/opt/yottadb/gui/g/vehu.dat	Edit Delete
CacheTemp*	TEMP	/opt/yottadb/gui/g/temp.dat	Edit Delete
TEMP	TEMP	/opt/yottadb/gui/g/temp.dat	Edit Delete
TMP	TEMP	/opt/yottadb/gui/g/temp.dat	Edit Delete
UTILITY	TEMP	/opt/yottadb/gui/g/temp.dat	Edit Delete
XTMP	TEMP	/opt/yottadb/gui/g/temp.dat	Edit Delete
XUTL	TEMP	/opt/yottadb/gui/g/temp.dat	Edit Delete

Second Incarnation

Home / System Administration / Global Directory Editor (GDE)

Global Directory Editor (GDE)   ＋   📄   🗑

Names ℹ

	Name	Region	Segment	File
☐	Local Locks	DEFAULT	DEFAULT	/home/vehu/g/vehu.dat
☐	%ydbocto*	OCTO	OCTO	/home/vehu/g/octo.dat
☐	*	DEFAULT	DEFAULT	/home/vehu/g/vehu.dat
☐	BMXTMP	TEMP	TEMP	/home/vehu/g/temp.dat
☐	CacheTemp*	TEMP	TEMP	/home/vehu/g/temp.dat
☐	DISV	TEMP	TEMP	/home/vehu/g/temp.dat
☐	DOSV	TEMP	TEMP	/home/vehu/g/temp.dat
☐	HLTMP	TEMP	TEMP	/home/vehu/g/temp.dat
☐	KMPTMP	TEMP	TEMP	/home/vehu/g/temp.dat
☐	SPOOL	TEMP	TEMP	/home/vehu/g/temp.dat
☐	TEMP	TEMP	TEMP	/home/vehu/g/temp.dat
☐	TMP	TEMP	TEMP	/home/vehu/g/temp.dat

Routines

Search
PSOLBL*

12 Routines

PSOLBL

PSOLBL1

PSOLBL2

PSOLBL3

PSOLBL4

PSOLBLD

PSOLBLD1

PSOLBLN

PSOLBL ✕   PSOLBL4 ✕   PSOLBLD ✕

```
1  PSOLBLD ;BHAM ISC/RTR - PRINTS LABEL ;4/14/93
2  ;;7.0;OUTPATIENT PHARMACY;**117,251,387,372**;DEC 1997;Build 54
3  ;External reference to ^PSDRUG supported by DBIA 221
4  ;External reference to $$DS^PSSDSAPI supported by DBIA 5425
5  S HOLDCOPY=COPIES
6  N PSODOSEW,PSODRGI,PSOLINFD S (PSODOSEW,PSODRGI,PSOLINFD)=0
7  START ;
8  K PSOSERV
9  S COPIES=COPIES-1,Y=$P(^PSRX(RX,2),"^",6) X ^DD("DD") S EXPDT=Y,Y=$P(^PSRX(RX,0),"^",13) X ^DD("DD") S ISD=Y
10 S Y=DATE X ^DD("DD") S DATE1=Y D NOW^%DTC S Y=% X ^DD("DD") S NOW=Y
11 S:'$P($G(^PS(59,+$G(PSOSITE),1)),"^",28) TB1=38,TB2=50,TB3=83 S:$P($G(^PS(59,+$G(PSOSITE),1)),"^",28) TB1=54,TB2=66,TB3=102
12 I '$D(^PS(52.4,RX,0)),$P(^PSRX(RX,"STA"),"^")=4 D UNKNOWN D  Q
13 .I $P(PSOPAR,"^",31),$P($G(^PSRX(RX,"STA")),"^")=4 D BLANK W @IOF
14 L1 W !?TB3 W:$G(RXRP(RX)) "(REPRINT)" I '$G(RXRP(RX)) W $P(PS2,"^",2)," ","("_$P(RXY,"^",16)_"/"_$S(+$G(VRPH):VRPH,1:" ")_")"_" ",$P(NO
15 L2 W ! I ($P(^PSRX(RX,"STA"),"^")=4)!($D(^PSRX(RX,"DRI"))&('$G(RXF))&('$G(RXP))) W ?TB1,"PRESCRIPTION # "_RXN_" HAS"
16 W ?TB3,RXN,"  ",DATE1,"  Fill ",RXF+1," of ",1+$P(RXY,"^",9)
17 I ($P(^PSRX(RX,"STA"),"^")=4)!($D(^PSRX(RX,"DRI"))&('$G(RXF))&('$G(RXP))) W !?TB1,"CAUSED A DRUG-DRUG INTERACTION" S PSOLINFD=1
18 W:'$G(PSOLINFD) ! S PSOLINFD=0 W ?TB3,PNM,"  ",SSNP S PSODRGI=1
19 I ($P(^PSRX(RX,"STA"),"^")=4)!($D(^PSRX(RX,"DRI"))&('$G(RXF))&('$G(RXP))) W !?TB1,"WITH THE FOLLOWING PRESCRIPTION(S):" S PSOLINFD=1
20 W:'$G(PSOLINFD) ! S PSOLINFD=0 W ?TB3,$S($G(OSGY(1))]"":OSGY(1),1:$G(SGY(1)))
21
```

Home / System Explorer / Globals

Globals

Search
PS*

16 Global(s)

^PS

^PSB

^PSCST

^PSD

^PSDRUG

^PSF

^PSI

^PSMDE

^%Z ✕   ^PS ✕

Globals Subscript Search

Number of nodes to show
100

> 📁 ^PS(50.073)
> 📁 ^PS(50.0731)
∨ 📁 ^PS(50.0732)

   📄 ^PS(50.0732,0)

     DUE QUESTION^50.0732^23^22

> 📁 ^PS(50.0732,1)
> 📁 ^PS(50.0732,3)
> 📁 ^PS(50.0732,4)
> 📁 ^PS(50.0732,5)
> 📁 ^PS(50.0732,6)

OCTO Tables

PATIENT ✕

Search: PATIENT

128 Table(s)

PATIENT

PATIENT_ALIAS

PATIENT_ALLERGIES

PATIENT_ALLERGIES_COM

PATIENT_ALLERGIES_COM

PATIENT_ALL_CHART_MAF

PATIENT_ALL_DRUG_CLAS

PATIENT_ALL_DRUG_INGR

PATIENT_ALL_ID_BAND_M

SQL Statement:

```
1  SELECT * FROM PATIENT LIMIT 100;
```

EXECUTE

	PATIENT_ID	NAME	SEX	SELF_IDENTIFIED_GENDER	DATE_OF_BIRTH	AGE	MARITAL_STATUS	RACE	OCCUPATI
1	1	ZZZRETFIVEFIFTYONE,PATIENT	M		2350407	86	2		
2	2	ZZZRETFIVEFORTYSEVEN,PATIENT	M		2350407	86	2	3	NURSE
3	3	EIGHT,PATIENT	M		2350407	86	2	3	LABORER
4	4	ZZZRETIREDZERO,PATIENT	M		2350407	86	6	3	TENNIS ELBOW
5	5	ZZZRETIREDFIFTYSEVEN,PATIENT	M		2350407	86	2	1	BUS DRIVER
6	6	ZZZRETIREDFIFTYTHREE,PATIENT	M		2350407	86	6	3	TENNIS

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Third Incarnation

Regions   ▶   View...

M Locks manager...   Add...
                                Edit...
Database: Healthy   Delete...

Journaling: Healthy   **Backup...**

Restore...   Create Database file...
                                Extend database...
Storage Usage: 🔍

AIM: /home/vehu/g/aim.dat   Integrity check...   Journaling Start / Stop...

DEFAULT: /home/vehu/g/vehu.dat Defrag / Compact...

DEFAULT: /home/vehu/j/vehu.mjl

OCTO: /home/vehu/g/octo.dat   Replication   ▶

OCTO: /home/vehu/j/octo.mjl

TEMP: /home/vehu/g/temp.dat

Regions:

	Name	Database path	Database	Journaling
🔍	AIM	/home/vehu/g/aim.dat	Healthy	Disabled
🔍	DEFAULT	/home/vehu/g/vehu.dat	Healthy	BeforeImage
🔍	OCTO	/home/vehu/g/octo.dat	Healthy	BeforeImage
🔍	TEMP	/home/vehu/g/temp.dat	Healthy	Disabled

Region | Journal | Names | Stats | Locks

☐ Show Advanced Parameters   Refresh ✎

Status: (Healthy)   **Used space:** 99.9 %   **# of processes:** 9

Database file

Param	Value
File name:	/home/vehu/g/vehu.dat
Auto DB:	No
Access method:	BG
Global buffer count:	4,096 blocks
Lock space:	400 pages
Async IO:	Off
Defer allocate:	Yes
Extension count:	1,024 blocks
Transaction number:	0x00000000008E9A9x

Create Database file...   Extend database file...

Database access

Param	Value
Record size:	16,368 bytes
Key size:	1,019 bytes

Close

Edit region: TEMP

Region	Journal	Names

Database file

Segment type: ○ BG   ● MM   ⓘ

Param	Value	Unit
Filename: ⓘ	/home/vehu/g/temp.dat [...]	
Lock space: ⓘ ⊗	500	pages

Database access

Param	Value	Unit
Record size: ⓘ	16368	bytes
Key size: ⓘ	1019	bytes

Edit   Cancel

Edit region: TEMP

| Region | Journal | Names |

Names

☑ Display system names

DISV

DOSV

HLTMP

KMPTMP

SPOOF

~~SPOOL~~

TEMP

TMP

UTILITY

Add name...

Delete...

Edit   Cancel

System information ✕

Routine search path:	/home/vehu/p/master_x86_64*(/home/vehu/p)
	/home/vehu/s/master_x86_64*(/home/vehu/s)
	/home/vehu/r/master_x86_64*(/home/vehu/r)
	/home/vehu/lib/gtm/libgtmutil.so
	/home/vehu/lib/gtm(/home/vehu/lib/gtm)
	/home/vehu/lib/gtm/plugin/o/_ydbgui.so
	/home/vehu/lib/gtm/plugin/o/_ydbmwebserver.so
	/home/vehu/lib/gtm/plugin/o/_ydbocto.so
	/home/vehu/lib/gtm/plugin/o/_ydbposix.so
	/home/vehu/lib/gtm/plugin/o/_ydbaim.so
Global directory:	/home/vehu/g/vehu.gld
Mode:	M
Encryption:	Not installed

Plugins:

Name	Description	Version	Vendor
_ydbaim	Library file: /opt/yottadb/master_x86_64/plugin/o/_ydbaim.so	n/a	n/a
_ydbgui	Library file: /opt/yottadb/master_x86_64/plugin/o/_ydbgui.so	n/a	n/a

Environment variables...

Close

Locks Manager ✕

By Namespace | By Region | By Process

🔒 ^%ZTSCH("SUBLK","ROU:vehu",178)
🔒 ^%ZTSCH("TASK",1015)
🔒 ^%ZTSCH("TASK",1017)
🔒 ^%ZTSCH("TASK",1018)
🔒 ^%ZTSCH("TASK",1019)
🔒 ^%ZTSCH("TASK",1020)
🔒 ^HLCS("HLCSLM")
🔒 ^XMBPOST("POST_Mover")
🔒 ^XMBPOST("POST_Tickler")

Refresh

Terminate lock owner...

Clear lock...

Close

Extend region: DEFAULT ✕

Current size:	785,214	blocks	3.00	GiB
Free space:	14,448,737	blocks	55.12	GiB
Block size:			4,096	B

Extension: ● In blocks | 1024 | blocks
○ In Bytes

■ Current size ■ Extension ■ Available space

|				
New size: ℹ	786,238	blocks	3.00	GiB
Available space:	14,447,713	blocks	55.11	GiB

Extend | Cancel

Implemented Features

- System Information (Plug-ins, Environment)
- View, Create, Edit, Delete Regions and database (post creation GDE definition update still be done)
- Extend Databases
- Start/Stop Journaling
- Lock Management (LKE)
- Tabbed Global Viewing (in progress)

Planned Features

- Tabbed Routine Viewing

- Trigger Administration

- Backup/Restore

- Integrity Check

- Defrag (mupip reorg)

- Replication Administration

Demo
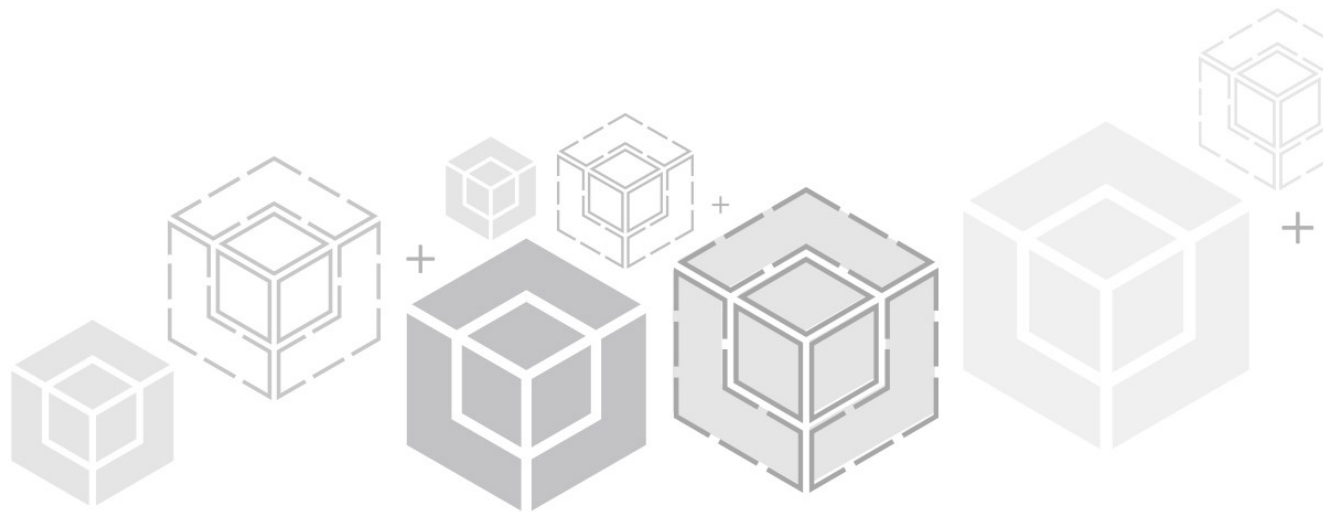
Software Stack (Frontend)

- https://gitlab.com/YottaDB/UI/YDBGUI

Name	Version
Bootstrap	4.6.2
Bootstrap Icons	1.8.0
jquery	3.5.1
jquery-ui	1.13.2
jstree	3.3.12

Software Stack (Backend)

- M-Web-Server (soon to be moved to a YDB-only Simplified Web Server—please see my other talk)

  - File resources (including front end components) served unchanged.

  - Web Services served by API end points

    - (see https://gitlab.com/YottaDB/UI/YDBGUI/-/blob/master/docs/rest.md)

Try for yourself (port 8089)

```
docker run -dp 1338:1338 -p 8089:8089 --name=octo-vehu
yottadb/octo-vehu:latest-master
```

Install and Running on your instance

```
mkdir build && cd build

cmake .. && make && sudo -E make install
```

- Add `$ydb_dist/plugin/o_ydbmwebserver.so` and `$ydb_dist/plugin/o/_ydbgui.so` to your `$ydb_routines` (or use `ydb_env_set`)

```
$ydb_dist/yottadb -r %ydbgui [--port nnnn]
```

YottaDB

Thank You!

yottadb.com