

The Road to Using Python with McIDAS-X

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m

BATCH

McBASI

MACRO



Py

mcenv

BATCH

McBASI



Python

mcenv

BATCH



Python

mcenv



Python

MACRO

- **Originated with McIDAS-MVS and replaced by mcskeyin**
- **Sequential running of commands**
- **Required compiling (examples commands SP and SL)**
- **FORTRAN programming capabilities (still in McIDAS-XRD)**

```
.MDX CLE PREFIX= (CFIX)
IF (CSCHM.EQ.'SVCA')THEN
.MDX MIX T TD SPD PSL VIS PCP SNO WIN ID ZS ZCL ZCM ZCH GUS -
THAE THA + -
UNIT= X (CT) (CT) (CW) X X X X (CW) MDF= (MD) PREFIX= (CFIX) -
FORMAT= F8.1 X X X K3 F8.1 F8.2 -
DIVIDE= X X X X .1 DEV= (CDVC) (CDFILE) DERIVE= T TD PSL ZS
ELSE
.MDX MIX T TD PSL PRE VIS PCP SNO WIN ID ZS CIGH ZCL1 ZCL2 GUS -
THAE THA + -
UNIT= X (CT) (CT) X X X X X (CW) MDF= (MD) PREFIX= (CFIX) -
FORMAT= F8.1 X X K3 K3 F8.1 F8.2 -
DIVIDE= X X X .1 .1 DEV= (CDVC) (CDFILE) DERIVE= T TD PSL ZS
ENDIF
100
```

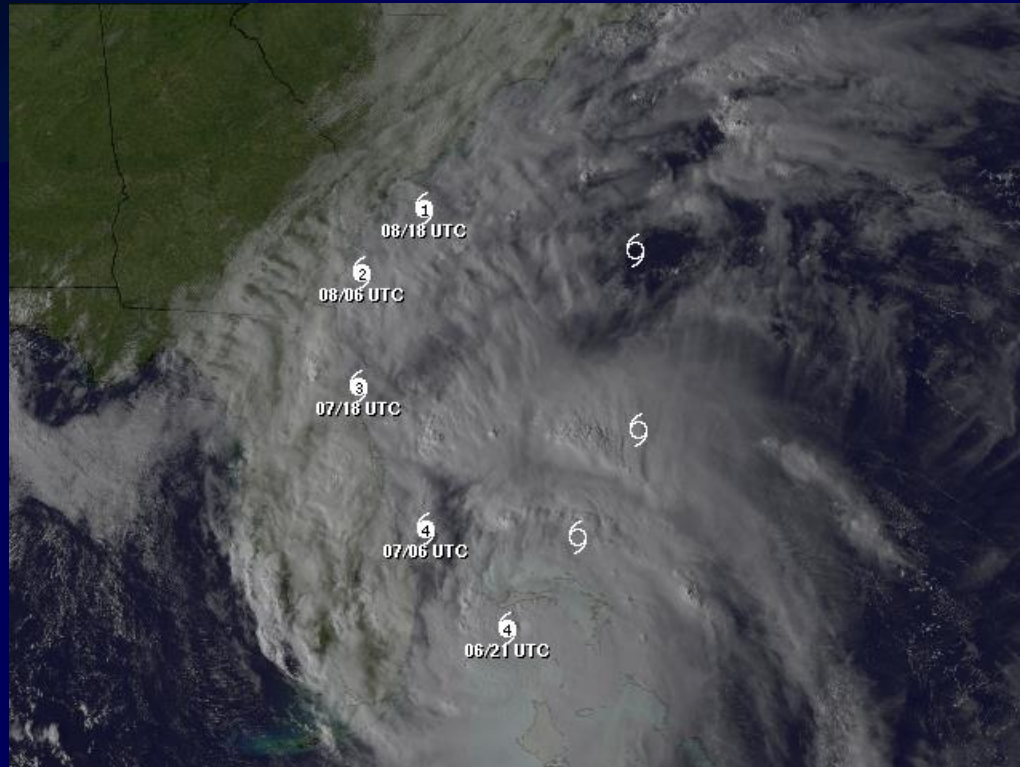
- **Originated with McIDAS-MVS**
- **Sequential running of commands**
- **No compiling needed**
- **Added basic programming capabilities**
- **Single character variable names!**

```
rem ? HURR name map source color size frame labcol
rem ?      name - Name of the storm (no default)
```

```
43  let q$=mid$(a$,1,4)
    if q$=eof$ close 20 : return
    if mid$(a$,1,2)="$ $" close 20 : return
    if mid$(a$,1,3)="  " close 20 : return
    if a$="" close 20 : return
    print a$
    if mid$(a$,25,1)="D" goto 44
    keyin "ECHO DEV=T POSTIME.DOC A {";mid$(a$,7,3);mid$(a$,10,2);" UTC}"
    let x(i)=val(mid$(a$,16,4))
    let z(I)=val(mid$(a$,30,3))
    print x(i), y(i), z(i)
    if x(i)>n LET n=x(i)
    if x(i)<o LET o=x(i)
    goto 42
44  return
```


McBASI

- Originated with McIDAS-MVS
- Sequential running of commands
- No compiling needed
- Added basic programming capabilities
- Single character variable names!



- **Originated with McIDAS-PC/OS2**
- **Sequential running of commands**
- **No compiling needed**



```
MDX CLE PREFIX=%1
SF 1
EG
LWU DEL OUTPUT.TXT
MDX MIX T TD SPD PSL VIS PCP SNO WIN ID ZS ZCL ZCM ZCH GUS -
THAE THA UNIT= X %3 %4 %5 X X X %3 MDF= %2 PREFIX= %1 FORMAT= F8.1 X X X
K3 F8.1 F8.2 DIVIDE= X X X X .1 DERIVE= T TD PSL ZS DEV=OUTPUT.TXT
```

BATCH \$ 5 F F KTS MYBATCH.BAT



mcenv

- **Originated with McIDAS-X**
- **Sequential running of commands**
- **No compiling needed**
- **Added shell scripting capabilities**
- **Works well with cron**

```
#!/bin/bash
export hr=$1
export jday=$2
export hour jday
LOG=$ADMIN_DIR/model_${hr}${jday}.log
export PATH=/home/oper/cronjobs/funded/magic_globe/bin/:$PATH
exec >$LOG
exec 2>>$LOG

Cd $DATA_DIR
mcenv -i 220 -g 32 -f 3@2048x4096 << 'EOF'
    dataloc.k ADD RTGRIDS $PRIMARY_GRID_SERVER
    run.k $hr FILE=MMF.MCB

convert -resize 1024x512 -adjoin -delay 10 -loop 0 hourly*.jpg
${FINAL_DIR}/animate_model_forecast.gif

EOF
```

- **Originated with McIDAS-X**
- **Sequential running of commands**
- **No compiling needed**
- **Shell scripting capabilities**
- **Added advanced programming capabilities**
- **Added netCDF capabilities and much more!**

```
satelliteFile = satellite + '.dat'
outFile = os.path.join(dataPath,satelliteFile)
outFileHandle = open(outFile,'w')

mcenv = mcidasx.mcidas.mcenv()
mcenv.logon('iiii #####')

datalocString='ADD ' + group + ' ' + server
datalocOut = mcenv.dataloc(datalocString)

imglistString = group + '/' + descriptor + ' FORM=ALL '
imgcheckString = group + '/' + descriptor

imglistOut = mcenv.imglist(imglistString)

imglistOutput = mccmdout2list(imglistOut.stdout)
```

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```
imglistOut = mcenv.imglist(imglistString)

print (imglistOut.stdout)
```

Image file directory listing for:EASTL/CONUS

Pos	Satellite/ sensor	Date	Time	Center Lat Lon	Band(s)
23	G-13 IMG	15 NOV 16320	15:45:00	14 72	1-4,6

IMGLIST: done



Python

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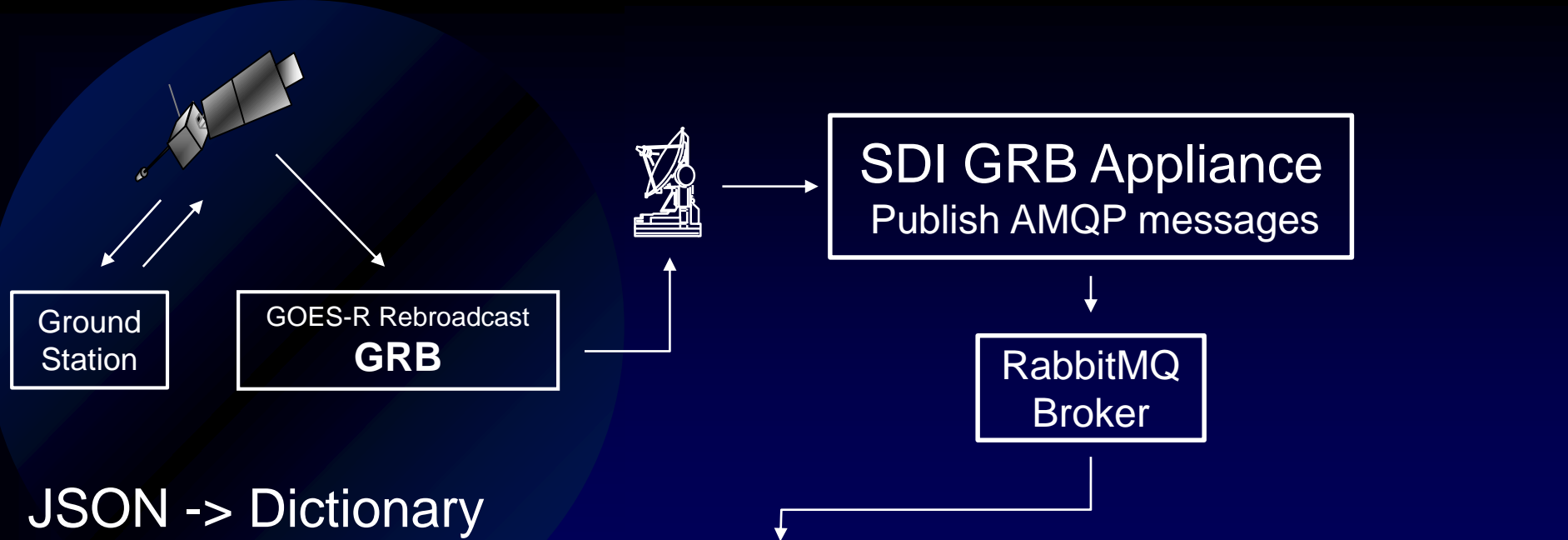
```
with open("newfile.txt") as f:  
    for line in f:  
        print line
```

```
open(10,"newfile.txt")  
10 input @10,a$  
   print a$  
   if mid$(a$,1,4) = eof$ goto 20  
   goto 10
```

- **Originated with McIDAS-X**
- **Sequential running of commands**
- **No compiling needed**
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```
with open("newfile.txt") as f:
    for line in f:
        print line

open(10,"newfile.txt")
10 input @10,a$
print a$
if mid$(a$,1,4) = eof$ goto 20
goto 10
```



```
pda-doe.GOES.G16.ABI.adde.realtime.ncdf.band.end: '{"coverage": "CONUS", "message_type": "band", "title": "ABI L1b Radiances", "server_ip": "dcserve6.ssec.wisc.edu", "medium": "adde", "start_time": "2016-11-01 11:59:13.5", "path": "/data/goes/grb/goes16/2016/2016_11_01_306/abi/L1b/RadC/OR_ABI-L1b-RadC-M3C09_G16_s20163061159135_e20163061201519_c20163061201552.nc", "mode": "3", "satellite_ID": "G16", "status": "end", "instrument": "ABI", "server_type": "realtime", "adde_dataset": "TESTPDA/CONUS", "satellite_family": "GOES", "band": 9, "end_time": "2016-11-01 12:01:51.9", "satellite_location": "GOES-Test"}'
```

IMGDISP

ADDE Users
AMQP Listener
McIDAS-X Python

ADDE Users
AMQP Listener
McIDAS-X Python

IMGCOPY



Summary

	MACRO	McBASI	BATCH	mcenv	Python
Compiling	✓				
Help Section	✓	✓	✓		¹ ✓
Basic Programming	✓	✓		✓	✓
Advanced Programming				✓	✓
Shell Scripting		² ✓	² ✓	✓	✓
netCDF					✓
Core Supported	³ ✓	✓	✓	✓	³ ✓



If it's not broke
why fix it?



If it needs fixing
redevelop?



If it's new development
try new tools!



¹UNIX Shell Only

²Operating System Commands

³McIDAS-XRD – Next Release



If it's not broke why fix it?

```
rem
rem --- I'll assume that this job will no longer be necessary after
rem --- the year 2099 ...
rem
```

```
rem
rem --- Create variables for saving files
rem
  let p$ = "/dev/fs/D/home/magicadmin/magic_planet/real-time/"
  let v$ = p$ + "vis/MP-VIS-"
  let i$ = p$ + "ir/MP-IR-"
  let w$ = p$ + "wv/MP-WV-"
```

```
  let m$ = p$ + "vis-convert/MP-VIS-"
  let n$ = p$ + "ir-convert/MP-IR-"
  let o$ = p$ + "wv-convert/MP-WV-"
```

```
  let d$ = "20" + mid$(b$,28,5)
  let t$ = mid$(b$,35,2) + mid$(b$,38,2)
```



If it's needs fixing, redevelop?

Windows Scheduler



launch SUA Shell



start mcenv session



run McBASI program



create image with McIDAS-X Commands



run Windows batch file to convert image format



If it's needs fixing, redevelop?

Windows Scheduler



launch SUA Shell



start mcenv session



run McBAS program



create image with McIDAS-X Commands



run Windows batch file to convert image format

McIDAS-X
Python

Evaluate your existing code



Rick's Lines of Code



Thanks to:

Developers of McIDAS-X Python

Kevin Hallock
and
Jon Beavers



Questions