

# Cloud Compiling with CA Endevor



[www.cloudcompiling.com](http://www.cloudcompiling.com)



# Agenda

- CA Endeavor and Cloud Compiling Synergies
- Overview of Cloud Compiling
- CA Endeavor and Cloud Compiling Customer Benefits
- How Cloud Compiling Works
- Action Items and Next Steps

# Attendees

Endevor Global User Group

Cloud Compiling

- Charles Mills, Chief Development Officer
- Jeanne Glass, Sales & Marketing

# Synergies

- CA and Cloud Compiling work closely with IBM to optimize the total business value that IT organizations can get from their investments in System z
- CA Endevor and Cloud Compiling help development teams looking to drive computing workloads back to the mainframe in order to drive down costs and deliver superior service levels
- CA Endevor and Cloud Compiling provide solutions to increase the business value of mainframe applications
- Cloud Compiling is rapidly deployed and facilitates immediate cost savings in development and support activities

# Cloud Compiling Options

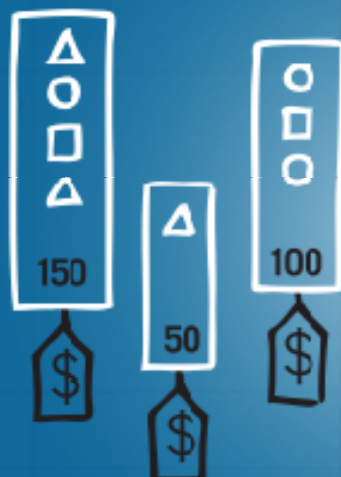
- Private Cloud
- Cloud Compiling Licensed as a Service (SaaS)
- Global IT Outsourcing
- IBM PartnerWorld and Destination Z Business Partner

**CLOUD  
COMPILING**

## CUT YOUR LICENSE FEES IN HALF\* WITH CLOUD COMPILING

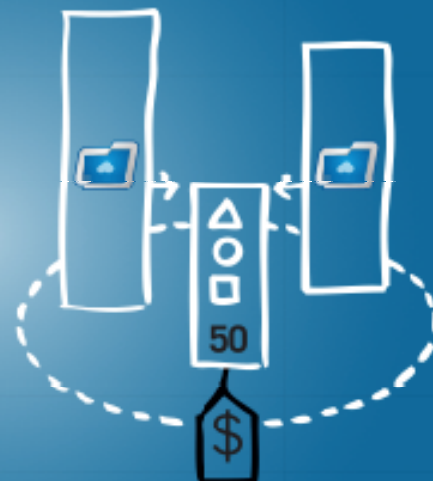
► Cloud Compiling, whether hosted in your private cloud or externally hosted, delivers virtual compiling with all of the benefits of cloud computing - significant cost savings, greater system service, increased flexibility, and the ability to scale quickly.

Today, network mainframes are often running multiple common languages and paying license fees for every single instance.



Multiple languages & Multiple mainframes = Redundant licensing & Maximum cost

Now all of your compiler licenses can be located on just one mainframe which can even be the one with the lowest MSU rating.



Centralized Licensing = Same performance but with minimum cost toward license fees.

\*Savings based on a private network with at least two mainframes.

### IMMEDIATE SAVINGS

Just like a rising,  
your expense reduction  
will be immediate.

### 100% GUARANTEED

Proving our bill-to-  
technology is flawless.

### NO NEED FOR DATA MIGRATION



Your installation process will be  
seamless because your valuable  
data will remain untouched.

### YOU WILL STILL UTILIZE IBM

#### LICENSING

It's just that with our  
additional technology  
you will only need one  
per language, which  
will save you money!

### CENTRALIZED COMPILING SIMPLIFIES SCALING



"Our server hosts all"  
means instant additions  
and services.

### OUR INSTALLATION IS AS SIMPLE AS READING AN EMAIL



You'll be up and running in minutes.

### THERE'S NO RISK!



IBM's advanced tools  
superior skills, all come together  
and change your way of life.

For more information, contact us at 877-246-4322 or visit our website at [ibmcloudcompiling.com/](http://ibmcloudcompiling.com/)

**CLOUD  
COMPILING**



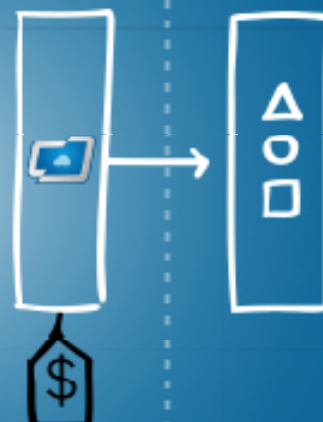
► **Cloud Computing** as a service helps customers who are struggling with IT budget constraints and a shortage of mainframe resources to support COBOL and other z/OS compilers.

**Today, most customers are maintaining multiple compilers and paying a license fee for every MSU in their environment.**

**Let us maintain native compilers on our mainframe while you install the Cloud Compiling technology on your mainframes at half the price.**



▲ = COBOL  
 ○ = PL/I  
 □ = Fortran



Licensed as a service = Same performance but minimia cost

**IMMEDIATE SAVINGS** 

Just like a study,  
your deposit notification  
will be immediate.

**100%  
GUARANTEED**

**Frankly, our Mill-cen  
technology is flawed.**

**YOU WILL  
STILL UTILIZE**



## LICENSING

As jobs are submitted, the Cloud Controller automatically translates source code to the native compiler or our secure Cloud Compiling Service runtime, compiles it there and returns the output to your target database without any intervention or additional steps. The entire process is completely and [transparently](#) handled by our secure, secure environment.



**OUR INSTALLATION  
IS AS SIMPLE AS  
READING AN EMAIL**



**We'll have great meeting by ourselves**

## THERE'S NO RISK!

The NAPHA logo features a stylized sunburst or star-like symbol composed of several radiating lines.



## NO NEED FOR DATA MIGRATION

Your installation process will be easier on because your reliable data will remain unchanged.

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**CLOUD  
COMPILING**

# \$20,428 BEFORE Cloud Compiling





\$12,402 (or less) AFTER Cloud Compiling  
(Guaranteed savings of 50% or more)



PSLC \$4376 + Cloud Compiling \$8026/month (50% of savings)

# Customer Business Benefits

- **Challenge:** CA Technologies' and Cloud Compilings' customers rely on mainframe products to safeguard the quality, security and efficiency of various mission-critical business processes. *To help customers reduce mainframe development costs and address the skills and resource constraints facing many organizations.*
- **Solution:** The combination of CA Endevor and Cloud compiling helps simplify and centralize software development.
- **Benefit:** CA Endevor and Cloud Compiling combine to accelerate the development process and reduce costs.

# How Cloud Compiling Works

[www.cloudcompiling.com](http://www.cloudcompiling.com)



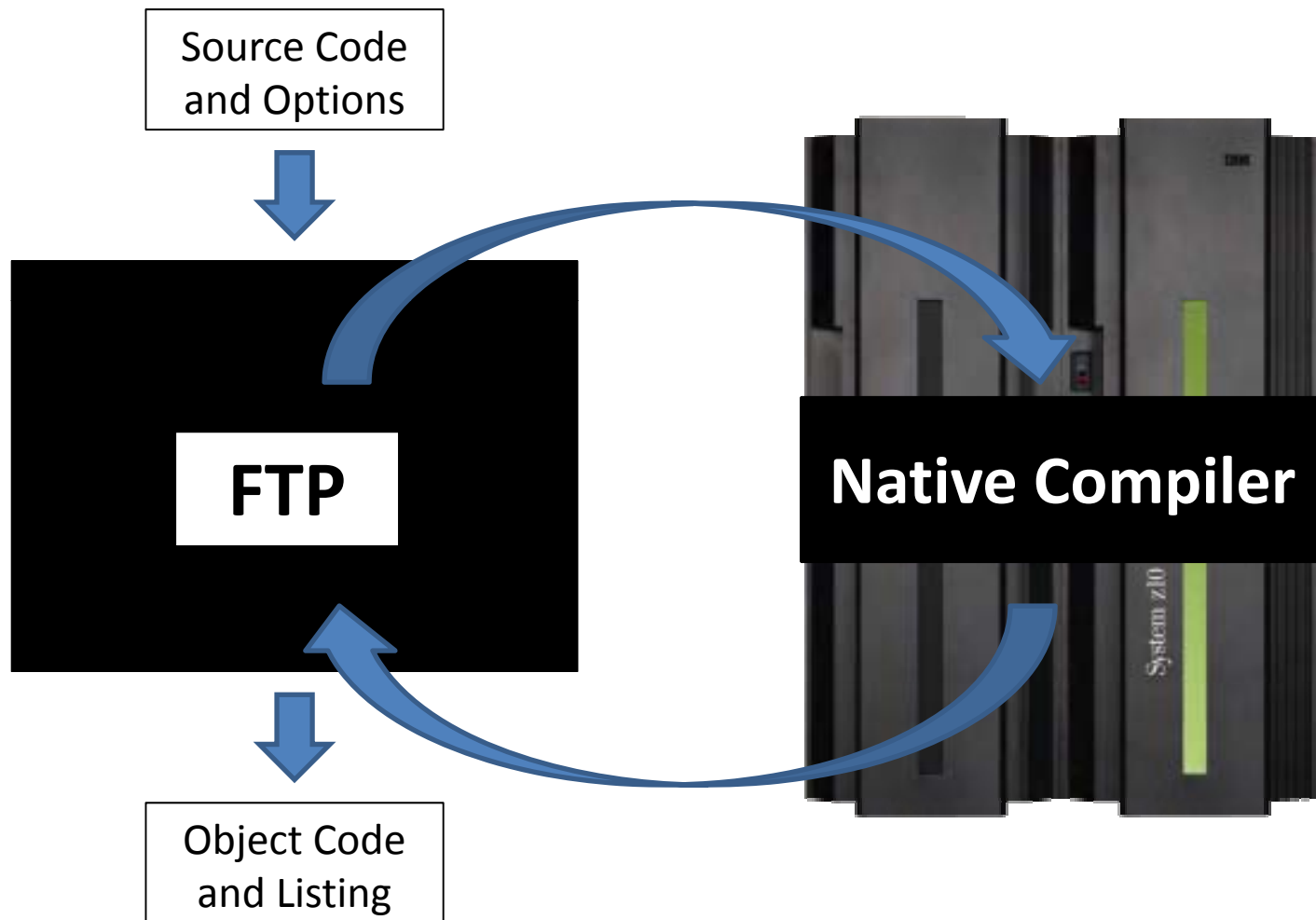
# Any Compiler is a Black Box

Source Code  
and Options



Object Code  
and Listing

# How a Cloud Compiler Works



# Transparency

```
//COMPILE EXEC PGM=TCCENTCB,  
// PARM='OBJ,ADATA,SZ(4096)'  
  
//STEPLIB DD DSN=TCC.LOADLIB,DISP=  
//SYSIN DD DSN=MYSOURCE...  
//SYSLIB DD DSN=MYLIB...  
// DD DSN=OTHERLIB...  
//SYSLIN DD DISP=(NEW,PASS),...  
//SYSPRINT DD SYSOUT=*  
//TCCPARMS DD DSN=TCC.PARM.FILE...  
//TCCPRINT DD SYSOUT=*
```

# How Cloud Compiling Works

- Analyzes environment: DD's, PARM=, etc.
- Reads through source code
- FTPs source code to target system
- Builds a new compile job and uses FTP to submit
- After job completes FTPs object code and listing back
- Note does *not* “move the job from one JES to another” or anything like that
  - Does not require JESPLEX or close coupling
  - Only requires an FTP (TCP/IP) link
  - Supports mixed JES2/JES3 environment

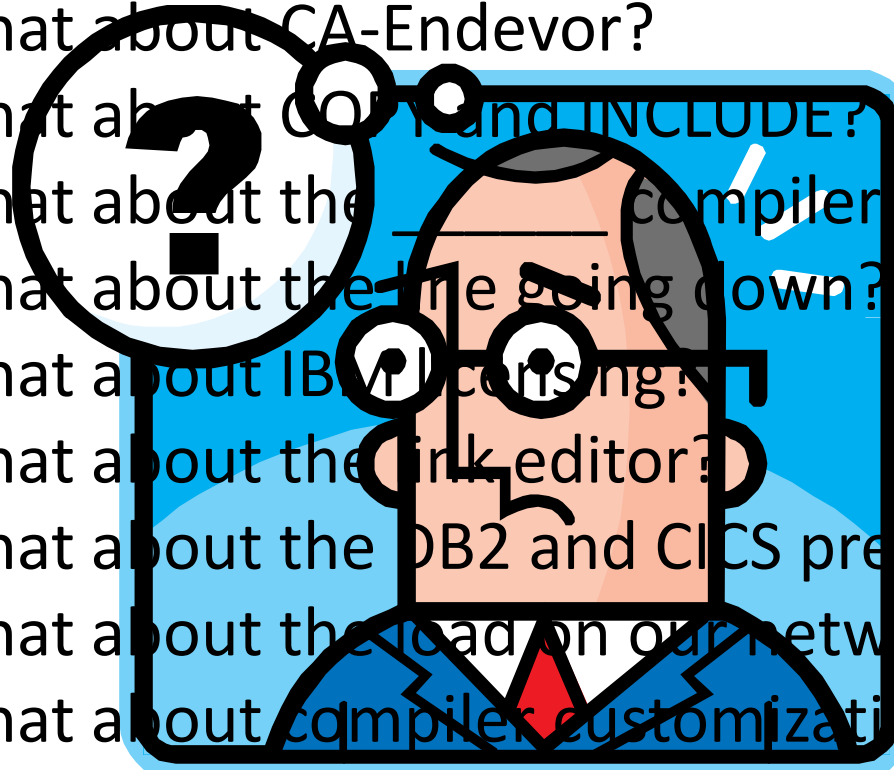
# A Totally New Job

```
//XBC001D  JOB  (), 'CHARLES MILLS', MSGCLASS=H, REGION=0M
/* Generated by Cloud Compiler PLIOPTV2 V3R0.0 at 14:21:53 on 7/15/2010
/*  on behalf of job/step RDC001A(JOB05072)/CLOUDCMP on node TESTJES
//PLIOPTV2 EXEC PGM=IEL0AA, COND=(0, NE), REGION=4M,
//  PARM=( 'SIZE(1000K), MARGINS(2, 72), X, NOBJ, DECK' )
//STEPLIB  DD   DISP=SHR, DSN=PLI230.PLICOMP
//SYSIN    DD   DISP=(OLD, DELETE),
//  DSN=XBC001.TCCFILES.XBC001D.FHM92JZA.SYSIN
//SYSLIB   DD   DISP=(OLD, DELETE),
//  DSN=XBC001.TCCFILES.XBC001D.FHM92JZA.SYSLIB
//SYSPRINT DD   BLKSIZE=0, DISP=(NEW, CATLG),
//  DSN=XBC001.TCCFILES.XBC001D.FHM92JZA.SYSPRINT, DSORG=PS, LRECL=133,
//  RECFM=FBA, SPACE=(CYL, (1, 1, 0))
//SYSPUNCH DD   BLKSIZE=0, DISP=(NEW, CATLG),
//  DSN=XBC001.TCCFILES.XBC001D.FHM92JZA.SYSPUNCH, DSORG=PS, LRECL=80,
//  RECFM=FB, SPACE=(TRK, (5, 10, 0))
//SYSUT1   DD   SPACE=(CYL, (2, 2, 0)), UNIT=SYSDA
```



# What about ...

- What about CA-Endevor?
- What about COPY and INCLUDE?
- What about the \_\_\_\_\_ compiler option?
- What about the line going down?
- What about IBM Licensing?
- What about the link editor?
- What about the DB2 and CICS pre-compilers?
- What about the load on our network?
- What about compiler customization?
- What about security?



# What about CA Endevor?

- They don't care
- Cloud compiler “looks just like” native compiler
  - Remember the black box analogy
  - They call an entry point and expect certain datasets to appear

# What about COPY and INCLUDE?

- Cloud compiler parses source code COPY or INCLUDE (as appropriate to language)
- FTPs relevant members and builds remote SYSLIB
- No source code stored on compile machine
  - *No synchronization issues*
- Handles default and “DD name” format
  - COPY member OF ddname
- Handles nested COPYs

# What about the \_\_\_\_ compiler option?

- Short answer: “no problem”
- Longer answer
  - Enterprise COBOL supports 59 options
    - ADATA, ADV, ARITH, AWO, BUFSIZE, ...
  - We care about 13 of them
    - ADATA means need to process SYSADATA
    - DECK means need to process SYSPUNCH
    - LIB means need to scan source code for COPY
    - Etc.
  - ADV, ARITH, AWO, BUFSIZE, etc. mean nothing to us
  - We pass them all to the compiler unmodified

# What about the line going down?

- Extensive diagnostics, FTP “deadman,” etc.
- Customizable retry count
- Ability to define multiple compile servers
  - Automated fall-back
- For single datacenter clouds, if network down programmers probably dead in the water anyway
- Enable Safe-Cloud™ feature if desired
  - Falls back to IBM compiler installed on same machine
  - Legal to leave installed and not pay so long as don't use
  - Safe-Cloud puts out audit message and you owe IBM for the month

# What about IBM Licensing?

- Private cloud
  - Licensing allows you to route all of your compiles to one machine
- Open cloud (Cloud Compiling SaaS)
  - Our licenses with IBM permit compiles as a service
  - No different than if your programmers used us as a service bureau

# What about the link editor?

- Link editor/binder licensed with z/OS, not compilers
- Link edit/bind in normal way after compile
- Link editor/binder does not know/care where object code came from
  - Remember the black box analogy

# What about DB2 and CICS pre-compilers and DB2 bind?

- Licensed with DB2 and CICS, not compiler
- Run before or after cloud compiler just like native compiler
  - Remember the black box analogy
- Co-compiler requires DB2 or CICS installed on compile machine
  - Same version a good idea!
- You can always use the pre-compiler



# What about the load on our network?

- Compile data volumes are surprisingly low
  - Two to three megabytes is a large compile
  - Like one medium-sized digital photograph
- Benchmark COBOL compile: 5489 lines
  - SYSPRINT: 21,431 lines or 2.8 MB
    - MAP option accounts for over half of that
  - 3 milliseconds over FICON Express8
  - 11 milliseconds over 2 Mb FICON
  - 1.3 seconds over ESCON
  - Fifteen seconds over T-1

# What about compiler customization?

- “We have unique corporate compiler default options – will we lose them?”
  - Customize exactly as now but on compile server mainframe
- “We have two programming groups with different default options”
  - Several ways to handle – documented in our manuals
- Open cloud – multiple customers on our machine
  - We have devised a way to handle multiple customizations

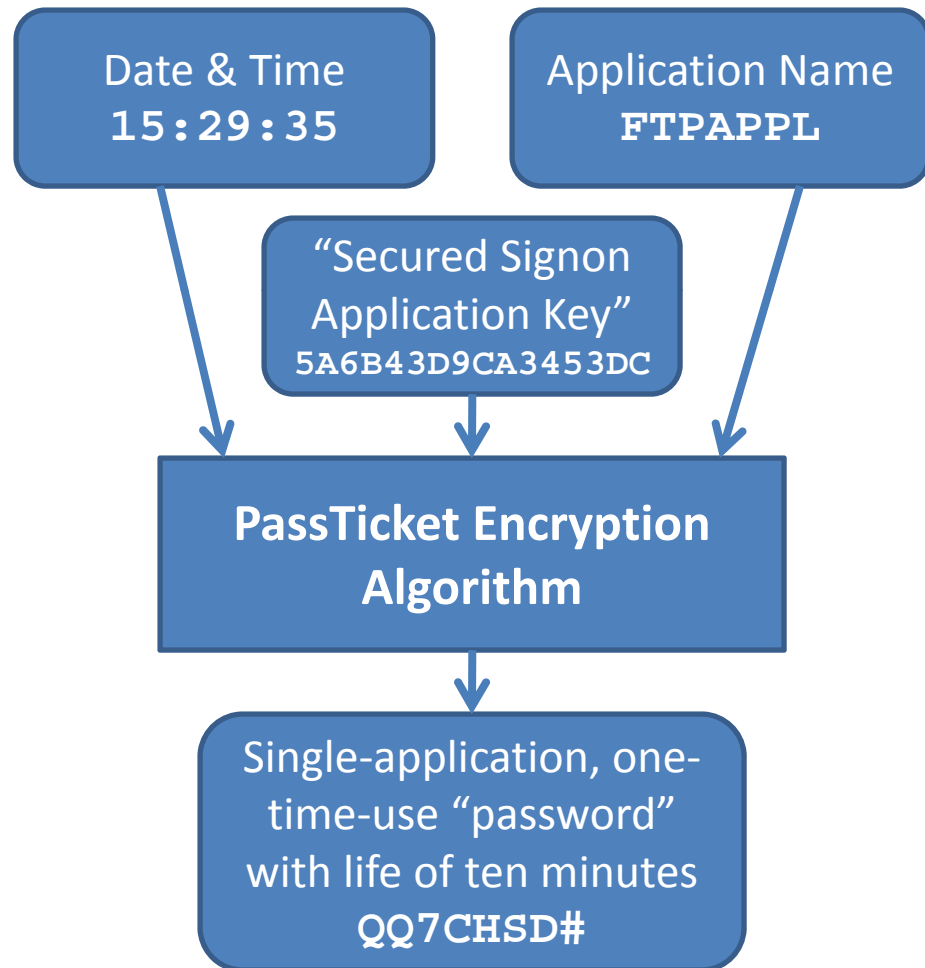
# What about security?

- No source code stored on compile machine
- Exists on compile machine for only a few seconds
  - `//SYSIN DD DISP=(OLD,DELETE),...`
  - Protected by RACF and ENQ'ed by z/OS
  - Cloud compiler uses FTP to delete if compile job totally fails
  - Unpredictable name like XCC001.TCCFILES.XCC001K.EORVA12U.SYSIN
- PassTickets
- Suggest defining userid with no TSO and limited dataset access
- Private Cloud
  - Just as secure as any other kind of compile
- Open Cloud
  - Secure technologies such as VPN, SSL, PassTickets, etc.

# PassTickets

- The problems
  - FTP requires a password
  - Don't want to transmit passwords over the network
  - Don't want to – or auditors won't let us – store passwords
  - Concern that access to one application may give access to others
- The solution ...

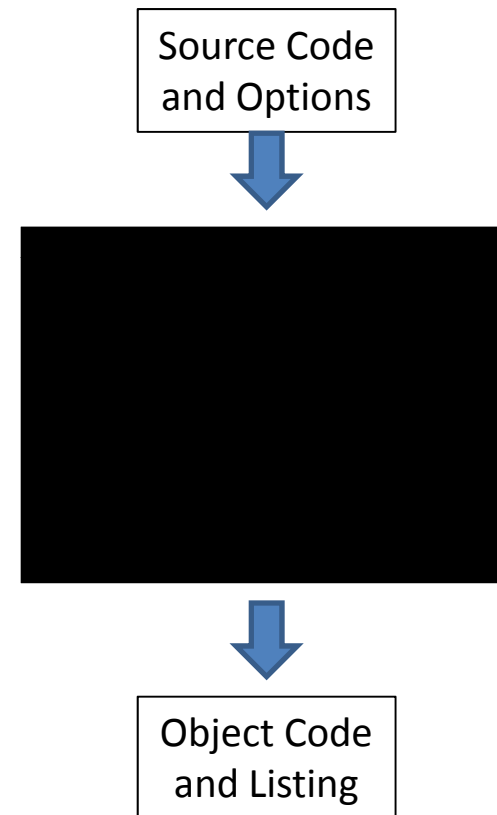
# PassTickets



- Exactly like a password ... but
  - No exposure in transmitting
  - No reason to store
  - Access to one application (FTP)
- Requires mainframe clocks set within a few minutes of each other (usually UTC)
- Program must be APF-authorized to generate
- Was an absolute bear for us to figure out
- But now have "cookbook" in our manuals
- Yes, supported also by ACF2 and TopSecret

# This all sounds complicated

- Don't mean to give the impression that using cloud compiling is complicated
- All of the things discussed happen automatically under the hood



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